MANUFACTURED HOUSING ALTERNATIVE

September 1983

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OF ALBERTA

The views and conclusions expressed and the recommendations made in this report are entirely those of the authors and should not be construed as expressing the opinions of the Alberta Department of Housing.

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FOREWORD

This study was made possible with funding provided by the Innovative Housing Grants Program of the Alberta Department of Housing. Originally conceived in 1978, the Program is intended to encourage, sponsor, and assist research and development in the fields of housing, site and subdivision design, energy conservation, site servicing and urban development. Generally, the aims of research funded by the Innovative Housing Grants Program are to reduce housing costs, increase the supply of appropriate housing or improve the utility or performance of dwelling units or subdivisions.

The main purpose of funding these studies is to examine the current issues in the field of housing and to develop innovations which offer improvements. Comments and suggestions regarding the information contained in these reports are welcome.

Innovative ideas come from a wide variety of applicants such as builders, developers, consulting firms, industry associations, municipal governments, educational institutions, non-profit groups and individuals. As the type of project and level of resources vary from applicant to applicant, the resulting documents are also varied.

Where possible the Department encourages the dissemination of study results under a standard cover and in a uniform format. This study, Manufactured Housing Alternative, was completed in May 1983 and subsequently released under a different cover.

Please send comments and suggestions or requests for further information to:

Innovative Housing Grants Program
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Alberta Department of Housing
September 1983

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EXECUTIVE SUMMARY

The study is aimed at raising the quality of site planning and design of manufactured housing parks while offering realistic engineering standards at a cost below that of the traditional single family housing subdivision.

As a caution to the reader it should be noted that the views and conclusions expressed and the recommendations made in this report are entirely those of the authors and should not be construed as expressing the opinions of the Alberta Department of Housing.

From a planning point of view the single most important factor is to improve the visual amenity by avoiding monotonus rows of homes along straight streets with little or no landscaping. Throughout the study it is attempted to show how variety can be introduced through using curved streets, variable setbacks, and alternative placement angles for homes. It is also recommended that a comprehensive landscaping plan be prepared for manufactured housing developments with a view to reducing the visual impact of the long narrow homes.

The general conclusion reached is that houses grouped in planned 10 to 15 unit clusters located in small cul-de-sacs and crescents with access to a central collector street provides the opportunity for an attractive and interesting development which offers privacy, identity and good accessibility.

From an engineering aspect, it was concluded that road widths and utility pipe sizing could be reduced below the normal required in a traditional single family subdivision without any significant effect on maintenance, reliability or convenience. Furthermore, cost savings of up to 30 percent over traditional subdivisions could be obtained. It is important to note

however, that the City of Red Deer would only accept these standards in a private development where the responsibility for maintenance and management belonged to the park owner.

If trends in Canada follow those already evident in the United States, well designed, high amenity manufactured housing communities will become more popular. It will take many years to overcome the stigma attached to the old trailer courts found in almost every municipality. Nevetheless it is concluded that a modern manufactured housing community can offer high quality single family housing at costs more normally associated with multi-family developments.

Alberta
DEPARTMENT OF HOUSING

Innovative Housing Grants Program

THE MANUFACTURED HOUSING ALTERNATIVE

DeLCan, De Leuw Cather, Western Ltd.

INTRODUCTION

The study examines the present status of manufactured housing developments in Alberta and specifically in Red Deer. The purpose of this analysis is to raise the quality of site planning and design of manufactured housing developments while offering practical engineering standards, to achieve development costs below that of a traditional single-family subdivision.

METHODOLOGY

Five privately owned mobile home parks and three mobile home subdivisions in the City of Red Deer are examined with respect to layout, road widths, servicing and management. A comprehensive evaluation is made of each development listing good features and bad features.

An 11-hectare site in Red Deer is then examined for possible use as a manufactured housing community and three alternative designs are worked out. The first design utilizes a traditional subdivision layout, the second is modified by introduction of narrower roads and curvature, while the third utilizes a cluster concept. Development cost estimates for the three designs are then compared.

CONCLUSIONS

From a site planning viewpoint it is found that the single most important factor which presently detracts desirability of mobile home developments is visual amenity. Visual amenity can be improved by avoiding monotonous rows of homes along straight streets with little or no landscaping.

The other important factor suggested is that the site planning should be comprehensive and include location of the home, driveway, privacy area, etc. Some general guidelines established are:

- use of curved streets
- variable set backs
- alternate home placement angles
- extensive landscaping

Application of these guidelines to a typical site in Red Deer yields a concept where homes are grouped in 10 to 15 unit clusters in short cul-de-sacs and crescents with access to a central collector street. This provides an attractive and interesting layout which offers privacy, identity and good accessibility (see Figure 1: Plan of Cluster Layout).

Copies of this report are available from Alberta Department of Housing, Innovative Housing Grants Program, 4th Floor, 10050 - 112 Street, Edmonton, Alberta T5K 2J1 (403/427-8150). Please refer to the order number shown in box at right, when requesting copies of completed reports.

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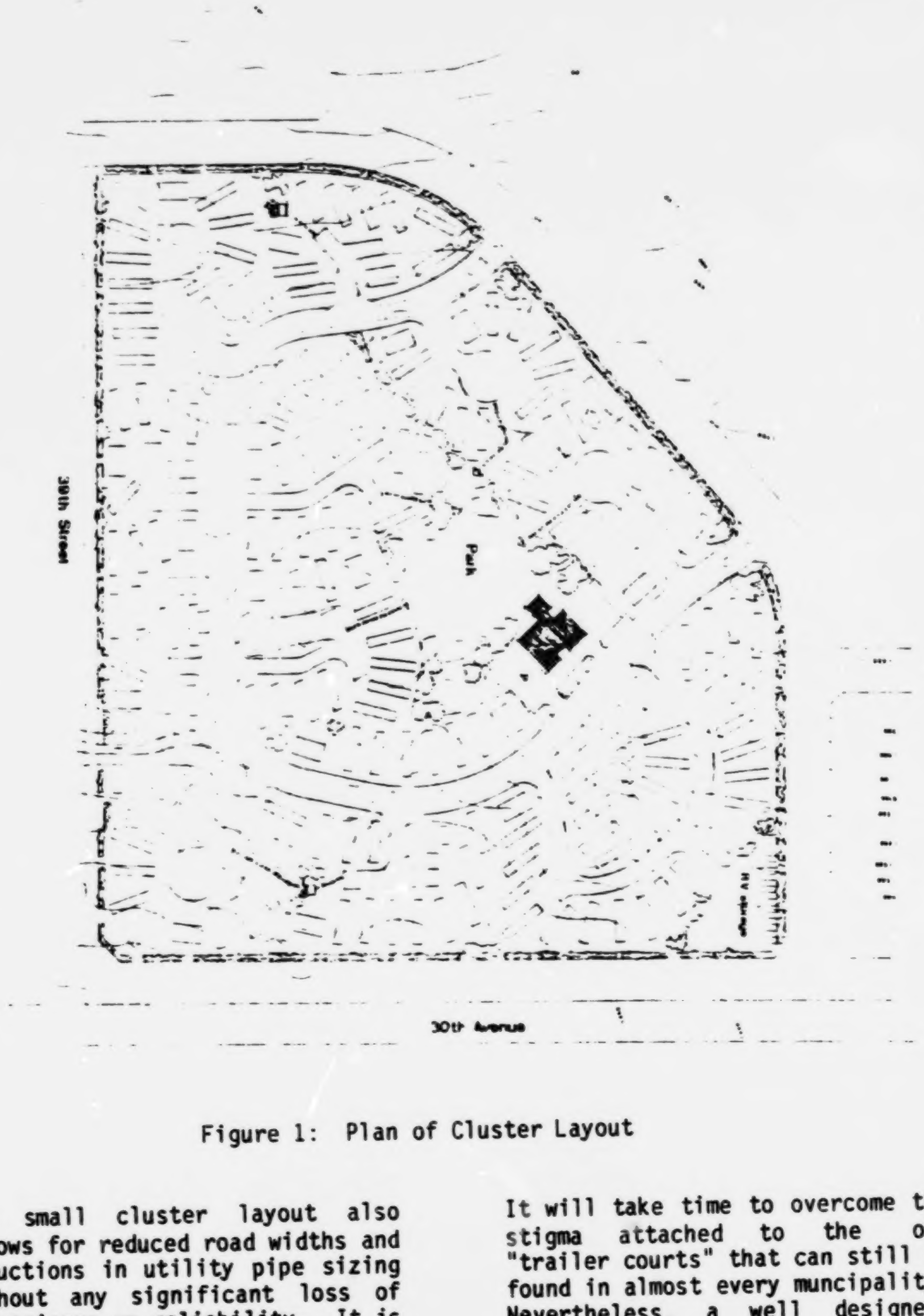


Figure 1: Plan of Cluster Layout

The small cluster layout also allows for reduced road widths and reductions in utility pipe sizing without any significant loss of convenience or reliability. It is estimated that development cost savings of up to 30 percent over a traditional single-family subdivision can be achieved.

It will take time to overcome the stigma attached to the old "trailer courts" that can still be found in almost every muncipality. Nevertheless, a well designed, high amenity manufactured housing community can offer high quality single family housing at costs more normally associated with multi-family developments.

INTRODUCTION

This report presents the findings of a study of manufactured housing developments in Red Deer. The study was carried out under an Innovative Housing Grants Program from the Alberta Department of Housing. The report is divided into four major parts.

Part I is limited to an inventory of existing developments and practices in the Red Deer area. The developments studied were judged to be generally typical of the types developed throughout Alberta.

One of the first tasks in the study was to set up a committee for discussion and review. Three committees were established and were structured as follows:

Main Committee:

David Horner, Executive Director, MHAA
John Ratzke, President, Parkside Holdings
Ralf Southwell, Senior Planner, DeLCan
Peter Gigliotti, Senior Engineer, DeLCan

Project Sub-Committee:

Ron Eberly, Melcor, Division Representative UDI
Gil Oslund, Representative HUDAC

City of Red Deer Sub-Committee:

Djamshid Rouhi, Planner
Ron Parker, Assistant City Engineer
Chi Lee, Transportation Engineer

Don Wilson, Assessor
Bob Oscroft, Fire Department
Al Roth, Electric Light and Power
Don Moore, Parks and Recreation

The next step in the process was to visit, examine and collect data on eight mobile home developments in the Red Deer area. These were chosen to represent developments both in the urban and rural context, private parks and mobile home subdivisions.

A site plan and summary of data collected for each development was then prepared.

An assessment and analysis of the main features which typify these developments was then carried out, together with a review of literature and studies already done in various parks in the Province.

The inventory carried out in the first part was not intended to be fully comprehensive. It was designed to provide an appreciation of some typical existing developments and to provide a background against which future, more innovative designs could be assessed.

The main purpose of the overall study was to arrive at innovative design guidelines which might form a basis for future mobile home developments and assist in establishing manufactured homes as a viable and desirable form of housing.

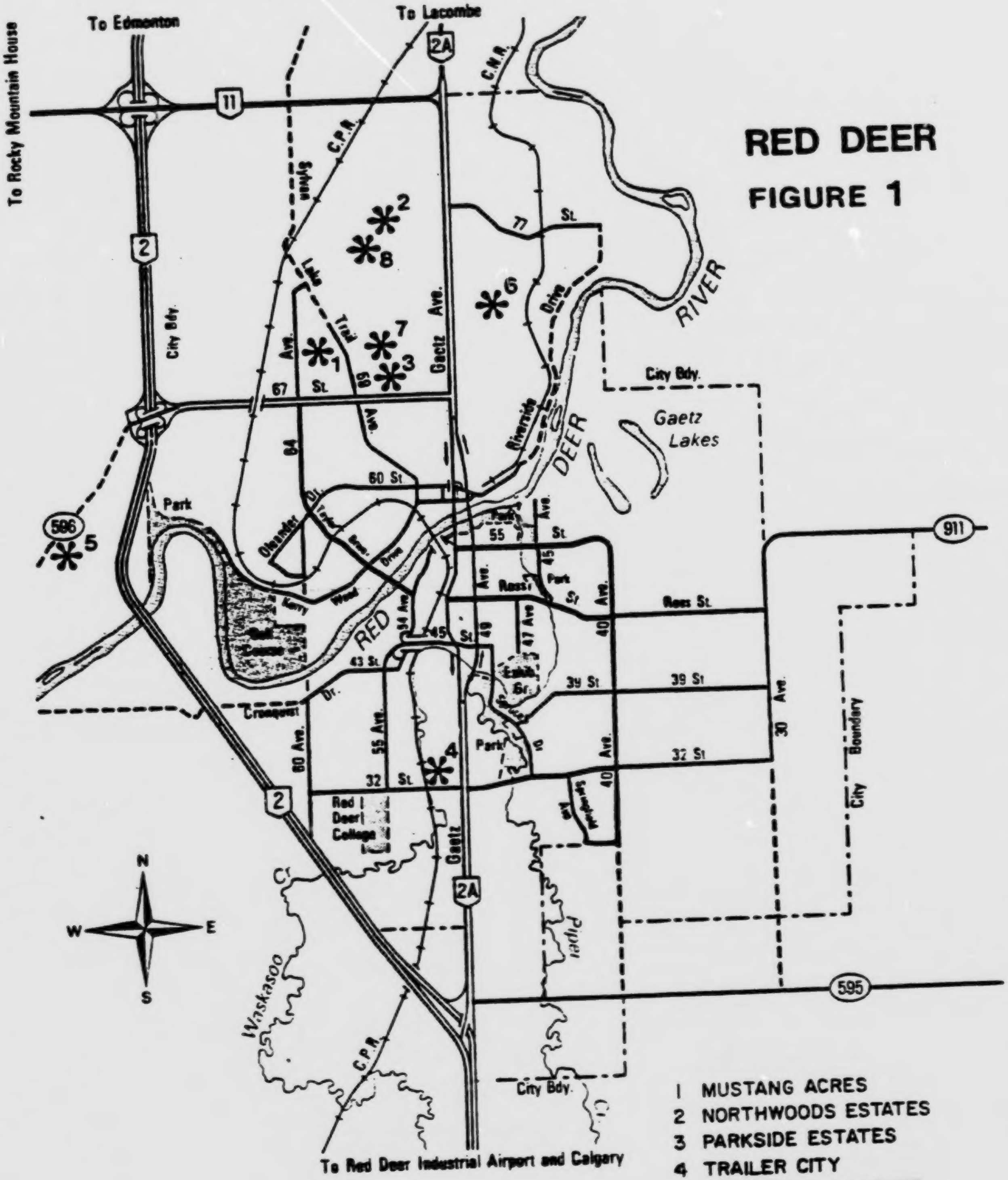
With this in mind, Part II of the study attempts to re-examine existing design guidelines and generate concepts which would avoid the pitfalls of existing manufactured housing developments and achieve interesting and attractive layouts while maintaining economy of construction. Three separate schemes were examined in detail, with the principles of street design and servicing techniques applied and the comparative amenities and costs presented.

The three schemes were reviewed by the committees and City of Red Deer Authorities. Part III of the report presents their comments and assessments of the design proposals, as well as a section addressing some of their concerns.

Part IV of the report presents the final conclusions and recommendations.

Acknowledgements

We would like to acknowledge and thank all the members of the various committees as listed, for their time and effort in studying and examining the proposals, attending meetings and putting forward their ideas in aid of the study.



RED DEER

FIGURE 1

1 MUSTANG ACRES
2 NORTHWOODS ESTATES
3 PARKSIDE ESTATES
4 TRAILER CITY
5 LES' TRAILER COURT
6 THE PINES
7 NORMANDEAU PHASE I
8 NORMANDEAU PHASE II

section 1.0

THE MANUFACTURED HOUSING ALTERNATIVE

PART I - REVIEW AND ASSESSMENT OF EXPERIENCE

PART I - REVIEW AND ASSESSMENT OF EXPERIENCE

1.0 GENERAL REVIEW

The review of manufactured housing developments in Red Deer covered seven sites within the City boundary and one approximately one kilometre west of Highway 2 just outside the City limits. The developments studied included:

1. Mustang Acres
2. Northwoods Estates
3. Parkside Estates
4. Trailer City
5. Les' Trailer Court
6. The Pines
7. Normandeau Phase I
8. Normandeau Phase II

The first five sites listed are rental parks, where a monthly charge is levied to the home owner for the use of the space. The Pines and Normandeau I and II developments have subdivided lots and in most instances the home owner also owns the lot. There is a fairly clear distinction between these two types of developments. The rental parks are administered by a park manager and most of the maintenance is the responsibility of the park owner. In contrast, the subdivided developments are similar to a traditional single family lot and dwelling with servicing and off-site maintenance supplied by the City. Figures 1 through 9 illustrate the developments surveyed and summarize the relevent data for each.

1.1 Size and Density

Size

The rental parks were all significantly larger than the subdivisions. The parks ranged in size from Mustang Acres at 22 hectares (54 acres) to Trailer City with 4.4 hectares. The average size was approximately 12 hectares (30 acres). The manufactured housing subdivisions ranged in size from 2.0 hectares (Normandeau Phase I) to 2.8 hectares (The Pines). The average subdivision size was approximately 2.3 hectares (5.8 acres).

Density

The average gross density for the rental parks surveyed was 16 units/hectare (6.5 units/acre). Densities ranged from approximately 13 units/hectare (5.2 units/acre) in Mustang Acres to 18 units/hectare (7.2 unit/acre) in Trailer City. These figures are similar to the densities which are found in most traditional residential areas which incorporate some smaller lots in the 10 to 13.5 metre range, or which incorporate 10 to 15 percent of the site as multi-family units.

The subdivisions ranged in density from 10.9 units per hectare (4.4 units/acre) to 16.4 units/hectare (6.6 units/acre) with an average gross density of approximately 13.4 units/hectare (5.4 units/acre). Again, this is a common density for residential development although it is about 20% higher than most of the adjacent single family housing.

1.2 Amenities

The provision of landscaping, clubhouse facilities, shopping facilities and recreation facilities was reviewed for each development studied. In addition, the site planning and general layout was assessed in terms of visual amenity and privacy. Because the survey was conducted in late Fall with some snow cover present, it was difficult to determine the level of landscaping and general appearance of grassed areas.

Description and comment on designs and landscaping are provided in more detail on each development in Section 2.0 which follows.

1.3 Rental Costs

The monthly rental charges were fairly consistent for the parks within the City. Charges ranged from $170 to $200 per month with the average calculated at $189 for single wide lots and $191 for double wide lots. Les' Trailer Court, at $160 month, was the lowest of the surveyed parks.

Generally the parks with no vacancies tended to have slightly higher monthly rentals. Mustang Acres and Northwoods Estates charge the same for a double wide and a single wide space, while Parkside Estates and Trailer City charge $7 to $10 more for a double wide lot.

The rental charges in Red Deer are generally similar to those in Calgary and Edmonton. A survey carried out by the Manufactured Housing Association of Alberta in February, 1982 showed that the average monthly rental of ten Edmonton area parks surveyed was $188 for a single wide and $187 for a double wide. A similar survey in December, 1981 carried out by "Homes Canada" in Calgary showed that the average monthly rental for 13 Calgary parks was $203 for single wide lots, and $241 for double wide lots. Section 1.4 and Tables 1 to 3 show the comparative statistics for typical park developments in Red Deer, Calgary and Edmonton.

The following key plan and exhibits present a summary of the information collected on each development in Red Deer.

1.4 Comparative Statistics: Red Deer, Edmonton, and Calgary

Tables 1, 2, and 3 present comparative statistics for Red Deer, Edmonton, and Calgary in order to identify the characteristics of the parks in Red Deer and how they are similar or dissimilar from parks in the two major Alberta urban centres.

a) Number of Mobile Homes

From Tables 1 and 3 it is noted that there are five Mobile Home Parks in Red Deer offering a total of 933 unit spaces. This compares with Edmonton 10 parks (3261 spaces) and Calgary 13 parks (2347 spaces)

Red Deer's population of 35,000 persons is only 6.0 percent of either Edmonton and Calgary, yet the number of mobile home spaces available is almost 29 percent of Edmonton's and nearly 40 percent that of Calgary. Since in all cases the vacancy rate is nearly zero, the figures indicate that in Red Deer, there is both a high demand and acceptance of this form of housing compared to the larger centres.

b) Park Size and Unit Mix

As Table 2 indicates, the average number of spaces per park in Red Deer is 187. This figure is considerably smaller than for Edmonton where park size averages 326 spaces, but somewhat surprisingly, is slightly larger than for Calgary, where the average size is 181 unit spaces. The smallest park in Red Deer is larger than its counterparts in Edmonton and Calgary. In all the communities, single-wides predominate. Red Deer parks offer the highest proportion of single-wide to double-wides. In all centres there are parks offering exclusively single-wides. None offer double-wides exclusively. Only two parks in Edmonton and one in Calgary have more double-wide spaces than single-wide spaces. These figures indicate that double-wide units are less popular in Red Deer than in the other two centres. Parks in all three centres indicate that nearly all the requests for spaces are for single wide units.

c) Park Standards

As Table 1 suggests, Red Deer parks offer both the highest proportion of spaces in the A Class as well as the highest number in the C Class*. These figures suggest that although the city appears to be catering to demand by developing more new parks than either Calgary or Edmonton, there are also more older parks around offering lower standard facilities. If the A/B Class is combined with the A Class, Edmonton would appear to offer the best overall mobile home accommodation with Red Deer and Calgary trailing in that order.

d) Monthly Rental

Table 3 presents a comparison of monthly rental rates by unit type and class. Due to the small size of sample in some instances, definitive conclusions are not possible. However, general observations include:

---

* See Table 1 for class definitions.

i) Red Deer rents are very similar to those of Edmonton both for single-wides and double-wides as well as within each Class. Although there are certain parks which charge slightly more than in Edmonton, overall Red Deer rents tend to be $5 to $15/month less than Edmonton.

ii) Calgary rents are noticeably higher than both Red Deer or Edmonton. Single wide rates are 8 to 11 percent higher ($20.00) and double-wides up to 33 percent greater ($61.00) than in Red Deer.

iii) In both Red Deer and Edmonton, double wide rates are marginally lower than for single wide spaces. This suggests the lack of demand for double-wide spaces. Again, Calgary is an anomaly with the average double-wide rates being $38.00, or almost 19% higher than the single-wide, indicating greater demand for double-wide spaces than in the other centres.

iv) Rates for individual parks in Calgary are found to be both much higher and lower than for Red Deer or Edmonton. The highest rate is 36% higher than that found in Edmonton - 53% higher than in Red Deer. The lowest rate is 68% lower than in Red Deer and 58% lower than in Edmonton. The wider range in Calgary suggests a different demand/supply situation than in Red Deer and Edmonton.

In summary, the various figures presented in this section suggest that Red Deer tends towards the Edmonton example with respect to rent, but is closer to the Calgary situation in terms of park size, type of unit spaces provided and mix of current spaces available. The overall supply of mobile home sites in Red Deer is much greater proportionally than either Edmonton or Calgary.

TABLE 2
MOBILE HOME PARK SIZE

SINGLE WIDE UNITS

	Range		Average	
	#	% of Total	#	% of Total
RED DEER	73-271	78.3-100.0	162	86.8
EDMONTON	59-574	20.0-100.0	225	69.1
CALGARY	45-424	40.1-100.0	146	80.6

DOUBLE WIDE UNITS

	Range		Average	
	#	% of Total	#	% of Total
RED DEER	0-75	0-21.6	25	13.2
EDMONTON	0-578	0-80.0	101	30.9
CALGARY	0-182	0-59.9	35	19.4

TOTAL

	Range #	Average #
RED DEER	79-346	187
EDMONTON	59-723	326
CALGARY	45-474	181

TABLE 3

MONTHLY RENTAL BY UNIT TYPE

SINGLE WIDE

	CLASS*-RANGE				CLASS*-AVERAGE				
	A	A/B	B	C	A	A/B	B	C	Total
RED DEER(1)	$170-185	$ 200	-	$160-195	$175	$ 200	-	$177	$183
EDMONTON(2)	$155-192	$160-222	$ 165	$150-200	$187	$ 200	$165	$180	$188
CALGARY(3)	$173-265	-	$180-296	$95-202	$193	-	$220	$133	$203

DOUBLE WIDE

	CLASS*-RANGE				CLASS*-AVERAGE				
	A	A/B	B	C	A	A/B	B	C	Total
RED DEER(1)	$170-195	$ 200	% -%	$ 202	$175	$ 200	% -%	$202	$151
EDMONTON(2)	$175-205	$180-227	$ 180	% -%	$187	$ 187	$180	-	$187
CALGARY(3)	$196-275	-	$195-309	$170-210	$255	-	$226	$197	$241

NOTES

Class*

A - Modern with facilities to accommodate today's home.
B - Lot sizes and location not desirable but has all facilities.
C - Older park, will not accommodate today's home (outdated).

(1) Total Sample Size 5 Parks - 2 with A Class
1 with A/B Class
2 with C Class

(2) Total Sample Size 10 Parks - 5 with A Class
2 with A/B Class
1 with B Class
2 with C Class

(3) Total Sample Size 13 Parks - 3 with A Class
6 with B Class
4 with C Class

section 2.0

2.0 INDIVIDUAL REVIEW

An overview of the general amenities and site design is provided below.

2.1 Mustang Acres

Mustang Acres is the largest development surveyed. The large central open space, with substantial tree cover on its southern end, is a major amenity feature for the Park. A grocery and laundromat are located at the east entrance from 59th Avenue. Planting and landscaping was not particularly noticeable adjacent to the units but there are several mature tree belts throughout the development which add considerably to the overall appearance.

The street system is comprised of numerous small cul-de-sacs and crescents which help to avoid monotonous rows of houses. However, there are portions of the site with over 200 m of straight road and this design combined with uniform placement and set-back of homes has detracted from the overall design quality. Because the development consists of both public and private roads there are seven access and egress points. This tends to split the development to some extent and reduce the cohesiveness of the park as a community.

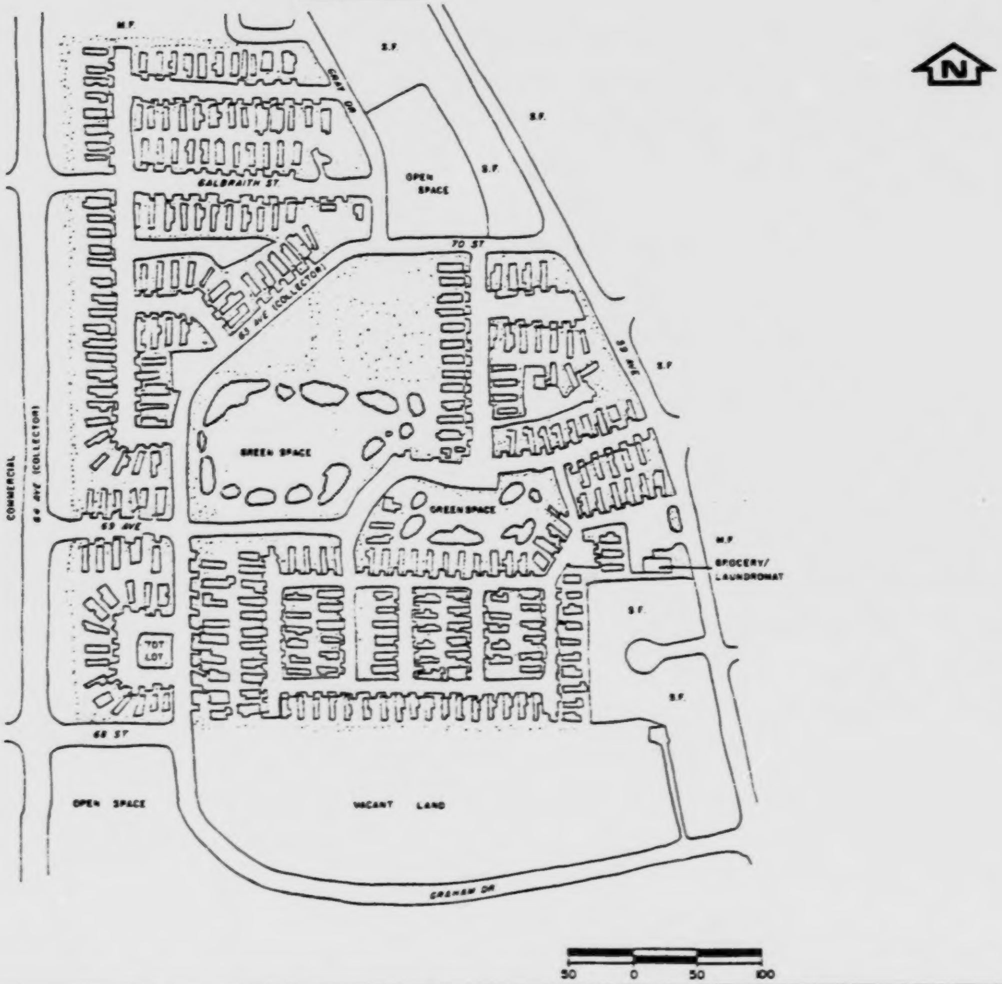
Services in this park are all connected to the City of Red Deer system and public City streets run through the development. Service installations and street widths are to City of Red Deer Municipal standards in the public streets and to the mobile home park standards internally.

The first phase of the development has slightly narrower streets with no curb and gutter, while the second phase has full width streets with curb and gutter. Maintenance of internal services is carried out by the Park owner.

NAME Mustang Acres	WATER Connected to City system
DATE ESTABLISHED 1970	SANITARY Connected to City system
RENTAL PARK Yes SUBDIVISION	STORM Partial
GROSS AREA 22 hectares	ROADS Paved, some curbing (40%)
NUMBER OF LOTS SW 269 DW 20 TOTAL 289	GARBAGE COLLECTION By City
GROSS DENSITY UNITS/HECTARE 13	COMMERCIAL Grocery, Laundromat
APPROX. RENT/MONTH $ SW 200 DW 200	CLUBHOUSE None
VACANT LOTS None	LANDSCAPING By tenant
SERVICING: PUBLIC PRIVATE Yes	CONTROLS Review by owner, no guidelines

FIGURE 2

SITE PLAN



- Entrance road width 15 m
- Internal road width 9 m
- Public road through development

2.2 Northwoods Estates

At the time of survey only part of the western portion of the site was occupied. However, the majority of streets and utilities are in place for the entire development. Early development plans for the site included a central building for a shop, management office, laundry and community centre. These facilities have not been constructed to date.

The overall design consists of a central park and playground and a continuous internal collector street which provides access to several smaller crescents. The main access is provided from 76th Street. Although the site design is satisfactory from a vehicle circulation point of view, it is not appropriate for a manufactured housing park. On the north side of the park the collector road is straight for over 350 m with a proposed uniform placement and alignment of homes. In several areas straight frontages of 200 m exist. This form of design is not appropriate for manufactured homes, particularly where the homes have uniform setbacks and alignments.

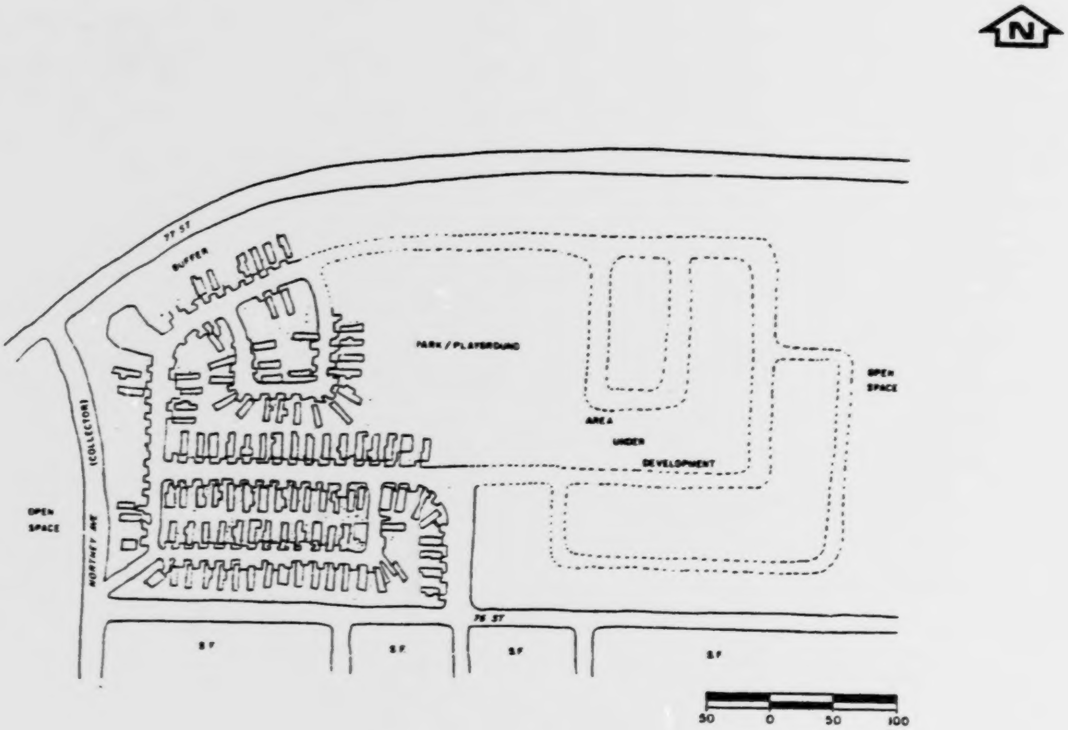
There have been problems in attempting to achieve full occupancy of the development. Some of these problems are related to soil conditions and high groundwater table. Other problems with marketing and management practices and ownership have left this development with less than one-third occupancy at this time. Servicing and road widths are all to City of Red Deer mobile home park standards.

In view of the foregoing and the site design, lack of landscaping and community features, as well as possible engineering problems associated with the development, it is not difficult to understand the high vacancy rate and low demand for lots.

NAME Northwoods Estates	WATER Maintained by owner
DATE ESTABLISHED 1978	SANITARY Maintained by owner
RENTAL PARK Yes SUBDIVISION	STORM Maintained by owner
GROSS AREA 19.8 hectares	ROADS Paved - Maintained by owner
NUMBER OF LOTS SW 271 DW 75 TOTAL 346	GARBAGE COLLECTION By City
GROSS DENSITY UNITS/HECTARE 17.5	COMMERCIAL None
APPROX. RENT/MONTH $ SW 170 DW 170	CLUBHOUSE No
VACANT LOTS 210	LANDSCAPING Owner/tenant
SERVICING: PUBLIC PRIVATE Yes	CONTROLS Owner/City

FIGURE 3

SITE PLAN



- Landscaping provided from home to road/side and back by tenant
- City by-law controls home spacing to 4.5 m
- Fence height of 1.2 m allowed on sides and back
- Playground and R.V. storage included

2.3 Parkside Estates

Parkside Estates is the best Red Deer example of a comprehensively planned Manufactured Housing Park. The main entrance from 68th Street is clearly signed and a secondary access is available from Nagel Avenue. The overall appearance is of a well maintained development with a reasonable level of on-site landscaping. The mature mixed coniferous and deciduous tree stands at the entrance add considerably to the overall amenity. On-site facilities include a club house with parking facilities and two large open space playground areas. Space for recreational vehicle storage is available.

Although the street layout is based on a simple grid pattern, the homes are clustered in groups of four with each cluster being served by a small cul-de-sac/parking area. Each cluster has its' own tot-lot equipped with double swing and sand-box. This design is considerably more attractive than the standard row layout and offers additional space and privacy to each unit.

The site has full municipal servicing constructed to City of Red Deer mobile home park standards, including storm sewer and underground wiring. While these services connect to the City's system at the periphery, maintenance of all internal services is the responsibility of the park owner. The City provides garbage collection, and fire and police protection.

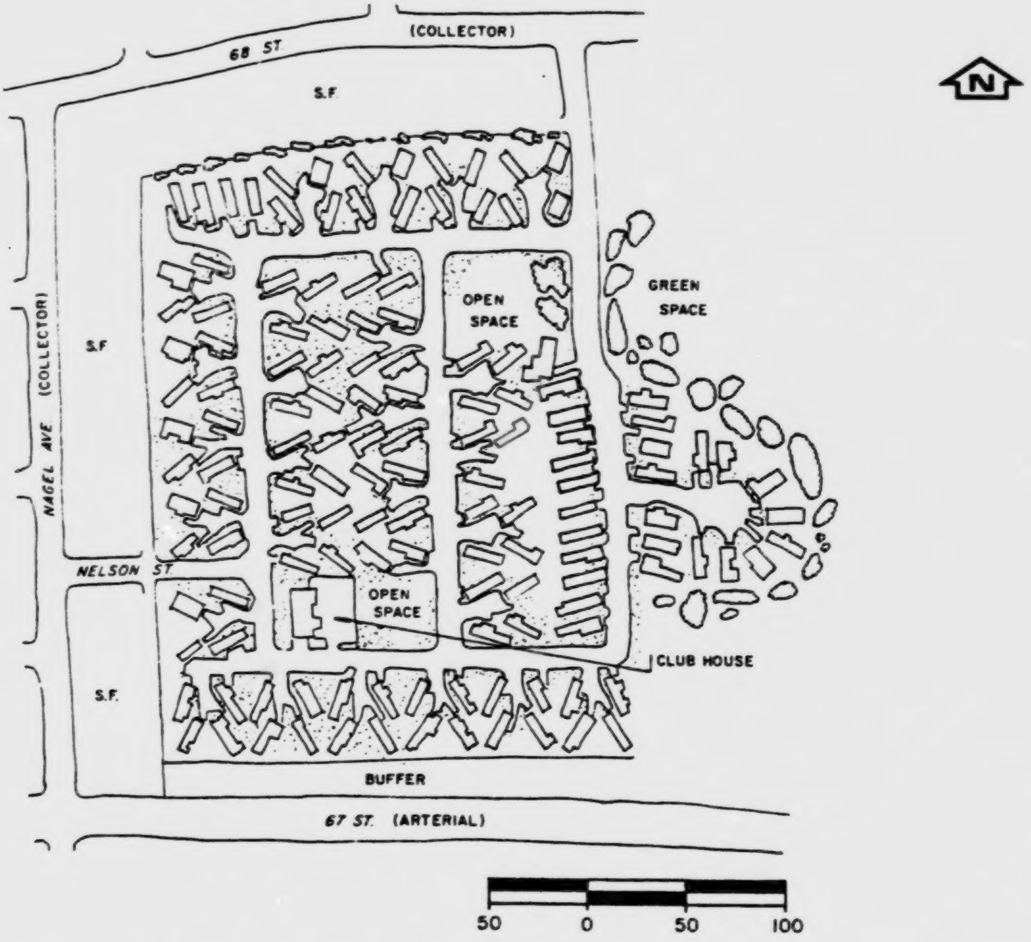
2.4 Trailer City

Like many City based mobile home parks, Trailer City is subject to redevelopment pressures. New apartment developments have been constructed adjacent to the site on the north and southeast. In view of this

NAME	Parkside Estates	WATER	Maintenance by owner
DATE ESTABLISHED	1975	SANITARY	Maintenance by owner
RENTAL PARK	Yes SUBDIVISION	STORM	Maintenance by owner
GROSS AREA	8.3 hectares	ROADS	Paved, no curbing
NUMBER OF LOTS	SW 118 DW 21 TOTAL 139	GARBAGE COLLECTION	By City
GROSS DENSITY	UNITS/HECTARE 16.7	COMMERCIAL	None
APPROX. RENT/MONTH	$ SW 185 DW 195	CLUBHOUSE	Yes, two playgrounds
VACANT LOTS	None	LANDSCAPING	By owner
SERVICING: PUBLIC	PRIVATE Yes	CONTROLS	Reviewed by owner & City of Red Deer

FIGURE 4

SITE PLAN

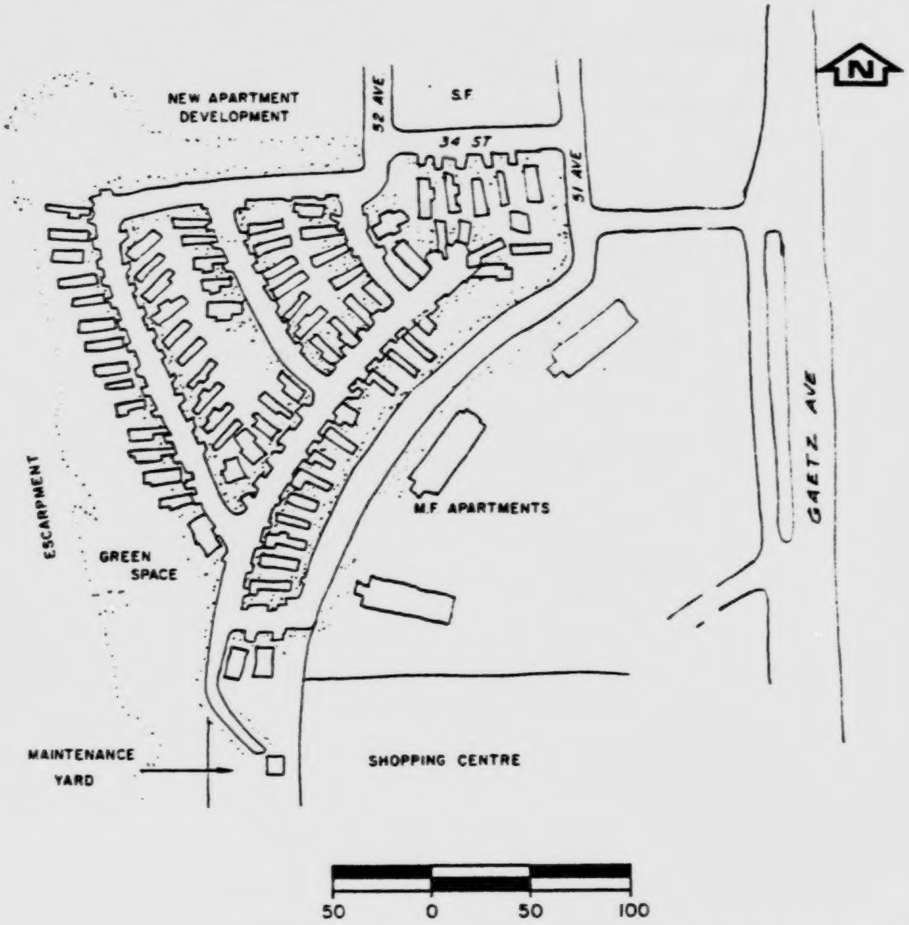


- Entrance road width 11 m
- Internal road width 10 m
- Road allowance width 12 m
- Owner does all landscaping, grass cutting and supplies bedding plants
- Aesthetics controls by park management
- Tot lots provided for each cluster
- Parking allowed on one side of street throughout

NAME Trailer City	WATER Connected to City system
DATE ESTABLISHED Not sure	SANITARY Connected to City system
RENTAL PARK Yes SUBDIVISION	STORM None
GROSS AREA 4.4 hectares	ROADS Paved, no curbing
NUMBER OF LOTS SW 73 DW 7 TOTAL 80	GARBAGE COLLECTION By City
GROSS DENSITY UNITS/HECTARE 18	COMMERCIAL None
APPROX. RENT/MONTH $ SW 195 DW 202	CLUBHOUSE None
VACANT LOTS None	LANDSCAPING By Tenant
SERVICING: PUBLIC PRIVATE Yes	CONTROLS Not available

FIGURE 5

SITE PLAN



land use pattern it is likely that the remaining portion of the park will be redeveloped in future years.

A small central tot-lot and some sparse landscaping are the only amenity features. A stand of mature decidous trees adjacent to the 51 Avenue entrance improves the appearance and in the summer acts as a visual buffer between the apartments and the mobile home park. The street layout is based on a slightly modified grid pattern with two access points. The small size of the park, gently curved streets and slightly angled home arrangement helps to avoid the visual problems associated with some of the larger parks surveyed.

The park has water and sanitary sewer services which connect to the City system. It is not known to which standard these services were constructed. The park does not appear to have any underground storm sewer, and drainage from gravel roads and pads is overland to a nearby gully.

The owner is responsible for maintenance of all on-site services. Garbage collection, police and fire protection are provided by the City. Power is by an overhead system.

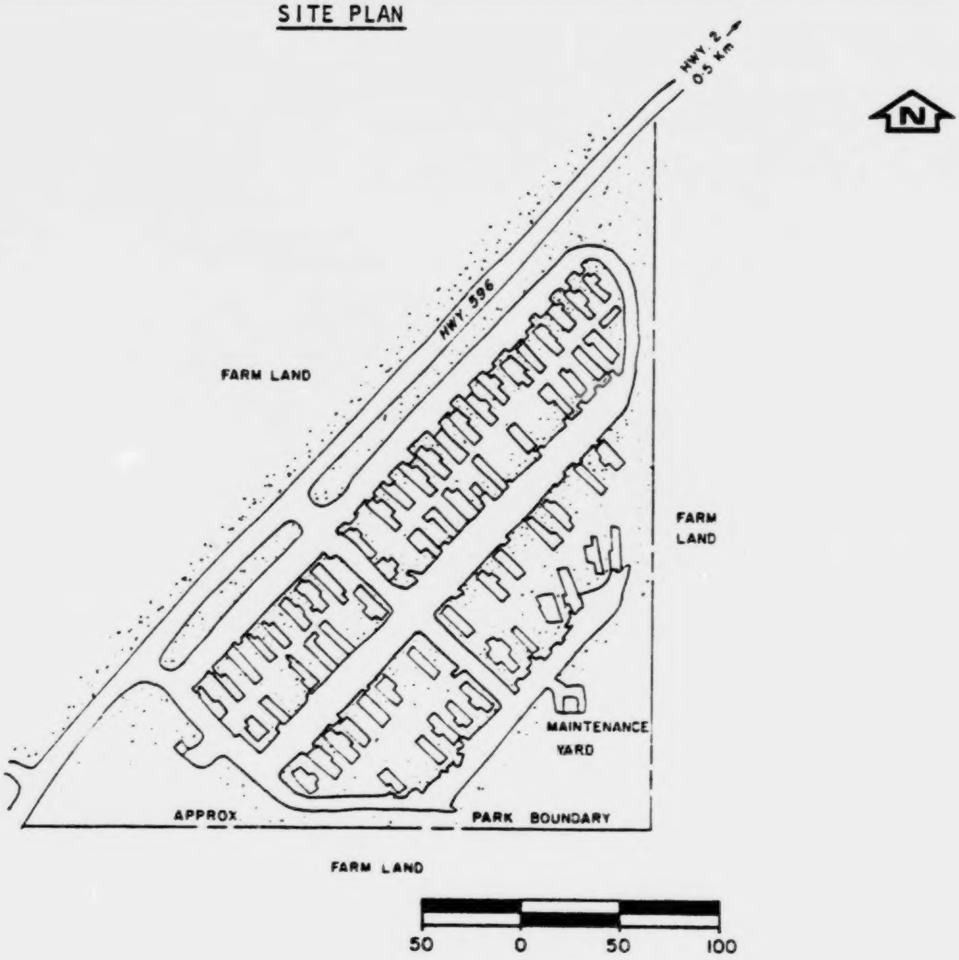
2.5 **Les' Trailer Court**

Les' Trailer Court is a rural based park developed in the residual part of the ¼ section cut diagonally by Highway 596. The park is typical of many rural parks throughout Alberta.

The grid layout consists of a frontage road and two interior streets parallel to the highway. The streets are wide with continuous angled parking on both sides. Homes have very little setback from the streets and privacy is minimal. A small playground and some sparce landscaping are the only

NAME Les' Trailer Court	WATER By owner - 3 wells
DATE ESTABLISHED Not sure	SANITARY Collection system with septic tanks
RENTAL PARK Yes SUBDIVISION	STORM None
GROSS AREA 5.25 hectares	ROADS Entrance paved/ remainder gravel
NUMBER OF LOTS SW 79 DW - TOTAL 79	GARBAGE COLLECTION Private
GROSS DENSITY UNITS/HECTARE 15	COMMERCIAL None
APPROX. RENT/MONTH $ SW 160 DW	CLUBHOUSE Playground only
VACANT LOTS 3	LANDSCAPING By tenant
SERVICING: PUBLIC PRIVATE Yes	CONTROLS County and owner approved

FIGURE 6


SITE PLAN

on-site amenities. The open fields and semi-mature trees on the east and south perimeter are positive off-site features.

Most of the homes are over ten years old and the quality and appearance of additions was generally low. A small poor quality site built dwelling was found adjacent to mobile homes in a small cul-de-sac to the east end of the park.

The term "trailer court" is appropriate for this type of development. It does provide accommodation for older trailers at reasonably low monthly rates but it is not a manufactured housing community.

Located outside the City of Red Deer, the trailer court has no access to municipal servicing. Water is obtained from several wells on site, pumped to a small reservoir and distributed by underground mains to each pad.

Sanitary sewage is collected by a piped system to several communal septic tanks. These in turn, discharge effluent to a large off-site subsurface tile field. The efficiency of the tile field operation is not known. Garbage is collected by private contract and trucked to landfill.

Surface drainage from gravel roads and pads is allowed to flow overland to a nearby watercourse. No adverse effects from this practice have been identified.

Each pad has its own propane tank for heating located adjacent to the home. Although this works reasonably well, it detracts from the site's aesthetics and creates undue truck traffic when tanks are re-filled.

2.6 The Pines

The Pines was developed by the City of Red Deer as a mobile home subdivision. The intent was not to create a self contained community but to try and integrate manufactured houses into the traditional single family subdivision. The Pines is a successful example of this type of integrated development.

The design consists of a small crescent and cul-de-sac serving twenty four lots. The crescent has development on one side only with a natural treed area in the centre. Most of the houses have a view of this open space feature. The rear yards have access to a lane which is shared with traditional single family houses.

The Pines exhibits several features which should be noted. The development is only partly integrated with adjacent houses. Integration is by rear lane only and no attempt has been made for side to side integration. The development is small, unobtrusive and has no long lineal frontages. Access can be gained to the development without passing through other single family housing areas and the central treed area provides privacy and amenity to the homes.

As a City developed subdivision, all roads and servicing are built to City municipal standards and operated and maintained in the same fashion as any other single-family subdivision in Red Deer.

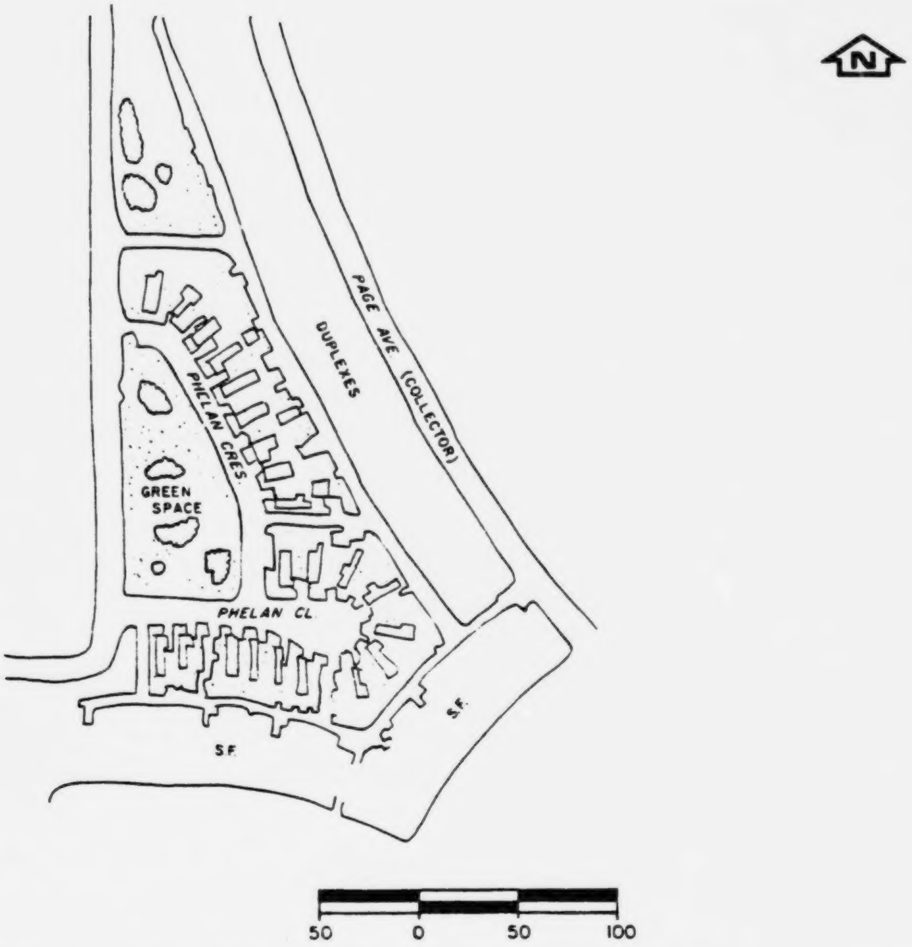
2.7 Normandeau Phase I

Normandeau Phase I mobile home subdivision consists of 25 lots located on a small crescent with direct access to 71 Street. The design shows an obvious attempt to "hide" the manufactured homes in the back portion of the

NAME The Pines	WATER City
DATE ESTABLISHED 1975	SANITARY City
RENTAL PARK SUBDIVISION Yes	STORM City
GROSS AREA 2.8 hectares	ROADS Paved/City standard
NUMBER OF LOTS SW 16 DW 8 TOTAL 24	GARBAGE COLLECTION City
GROSS DENSITY UNITS/HECTARE 8.6	COMMERCIAL None
APPROX. RENT/MONTH SW DW N.A.	CLUBHOUSE None
VACANT LOTS None	LANDSCAPING By owner
SERVICING: PUBLIC Yes PRIVATE	CONTROLS City by-law

FIGURE 7

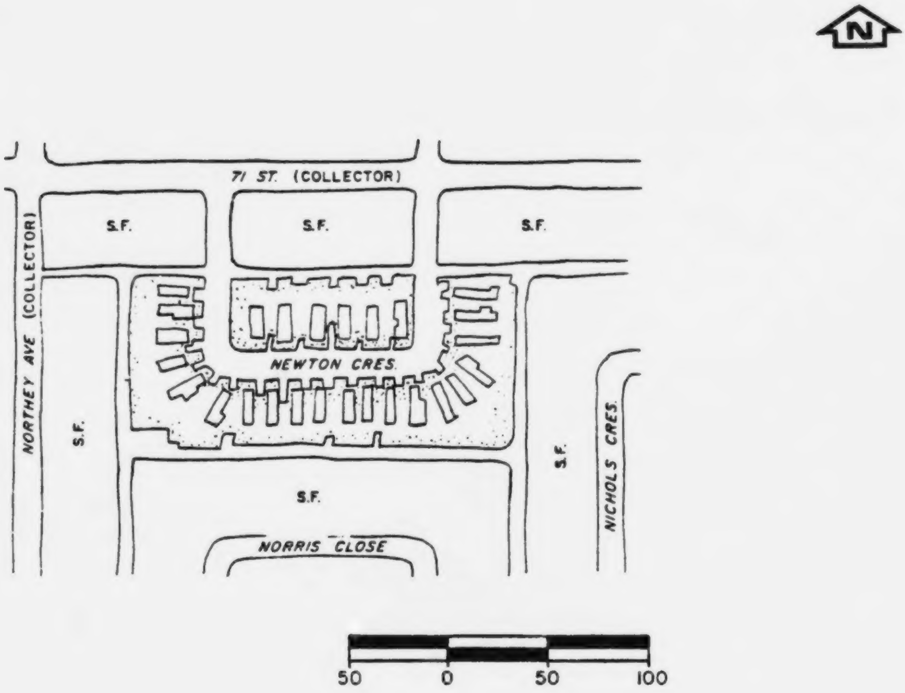
SITE PLAN



NAME Normandeau - Phase I	WATER City
DATE ESTABLISHED 1976	SANITARY City
RENTAL PARK SUBDIVISION Yes	STORM City
GROSS AREA 2.0 hectares	ROADS Paved/City standard
NUMBER OF LOTS SW 19 DW 6 TOTAL 25	GARBAGE COLLECTION City
GROSS DENSITY UNITS/HECTARE 12.5	COMMERCIAL None
APPROX. RENT/MONTH SW DW N.A.	CLUBHOUSE None
VACANT LOTS None	LANDSCAPING By owner
SERVICING: PUBLIC Yes PRIVATE	CONTROLS City by-law

FIGURE 8

SITE PLAN



crescent while maintaining traditional single family homes along the collector street (71 Street). Partial segregation is attempted by facing single family site built homes away from the crescent. Normally all homes would face the local street thus reducing frontage on the collector.

The small size of the development and the short lengths of lineal frontage have helped to achieve a reasonably successful development. However, this type of integration appears incongruous and somewhat forced.

As in the Pines, the subdivision was built by the City to their standards, and operated as such.

2.8 **Normandeau, Phase II**

The design philosophy behind Normandeau, Phase II was obviously similar to the Phase I development previously discussed. In this example the crescent is larger and accommodates 46 units. Again an attempt is made to screen the manufactured houses from Noble Avenue by a row of single family houses. The site has been slow to develop and there are still a number of vacant lots.

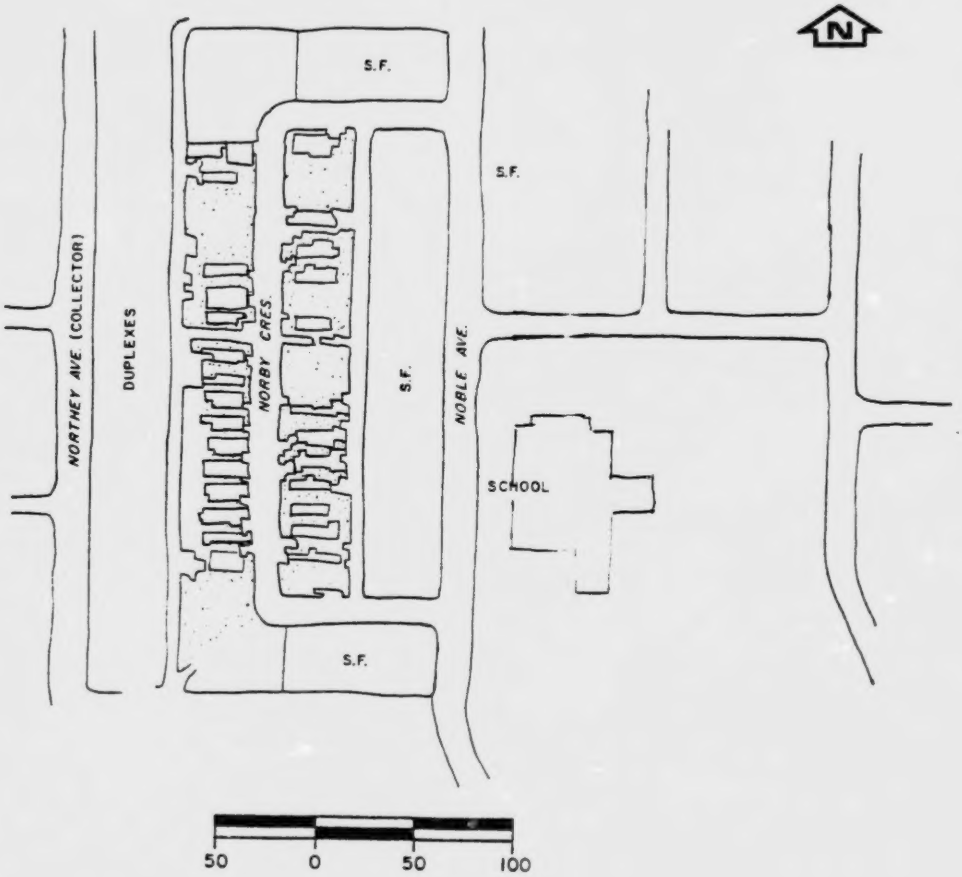
It is apparent that this type of integration is not generally desirable especially when it is combined with a fairly long 250 m lineal frontage with regular alignment and setback of homes.

Servicing standards are the same as Normandeau, Phase I.

NAME Normandeau - Phase II	WATER City
DATE ESTABLISHED 1978	SANITARY City
RENTAL PARK SUBDIVISION Yes	STORM City
GROSS AREA 2.8 hectares	ROADS Paved/City standard
NUMBER OF LOTS SW 32 DW 14 TOTAL 46	GARBAGE COLLECTION City
GROSS DENSITY UNITS/HECTARE 16.4	COMMERCIAL None
APPROX. RENT/MONTH SW DW N.A.	CLUBHOUSE None
VACANT LOTS 10	LANDSCAPING By owner
SERVICING: PUBLIC Yes PRIVATE	CONTROLS City by-law

FIGURE 9

SITE PLAN



section 3.0

3.0 EVALUATION

3.1 Amenities and Planning Standards

Amenities

The overall project quality and provision of amenity features varied considerably with the parks surveyed.

Mustang Acres and Northwood Estates both had large central park/open space features. Parkside Estates had smaller play yards and tot-lots associated with each housing cluster. Les' Trailer Court and Trailer City each had a small tot-lot which was generally considered to be inadequate for the size of development. As established in the Recommended City Standards for mobile home parks, 10 percent of the gross site area should be developed for recreation/open space.

Parkside Estates was the only park with a community club house, and Mustang Acres the only development with a convenience store and laundromat. Generally it is only possible to support these types of facilities in the larger parks (i.e., over 8 hectares). The ability to support commercial facilities on-site is also dependent on the proximity of other shops in the vicinity of the Park. In terms of fostering a feeling of community, a club house is perhaps more important especially if there is a high percentage of senior citizens residing in the park.

Space for parking and storage of recreational vehicles is also essential. Few of the developments made provision for R.V. storage on or close to the park. Again, the City of Red Deer recommends 750 square feet for every 10 lots as the minimum standard which should be accepted.

Landscaping

None of the parks surveyed had a high quality of landscaping. The mature tree stands inside or adjacent to some of the developments e.g. Mustang Acres and Parkside Estates, added considerably to the overall appearance. The extent of new planting appeared to be minimal although in fairness, a proper assessment should be done in the summer months.

In view of the general uniformity of the house designs, landscaping is considered to be a vital component of a successful manufactured housing community. A properly organized planting program should be established at the outset. If necessary, it could be implemented over a three to five year period. Emphasis should be placed on streetscape and shrub planting close to the units. More extensive requirements for landscaping which include the size and type of trees and shrubs to be planted, as well as the extent of grassed areas etc., should be required with the final layout plan prior to approval.

Design and Density

The two major problems identified with the parks and to some extent with the mobile home subdivisions surveyed, is the lack of innovation in street layout and arrangement of houses relative to the street. Long straight streets with end-on houses and uniform set-backs are monotonous and should not be permitted. It has been these design factors which have contributed towards the lack of acceptance of manufactured homes in traditional residential areas and to the poor design and lack of visual amenity in the parks. Parkside Estates was the only design in the survey which showed innovation with regard to unit placement.

Curvilinear streets or short lineal frontages should be encouraged together with variety in lot layout, and setbacks. Development densities should not normally exceed 8 units per acre (19 units/hectare). If this density is achieved together with good landscaping and amenities, there is an excellent chance of producing a visually attractive manufactured housing community.

Subdivisions

Similar design principles to those of good single family residential planning also apply to manufactured home subdivisions. However, more care must be taken in site selection relative to adjacent uses. It is important to find the correct balance between placing the homes in a residential context and trying to achieve full integration on a side by side basis with site built single family homes. Double wide units due to their more traditional proportions are easier to integrate than a single wide unit. Again, The Pines is cited as an excellent example of good integration of the manufactured home in an urban residential context. Small developments of up to 30 homes are easier to integrate than larger projects.

The practice of relegating the manufactured home to locations behind singles or out of sight, should normally be avoided. This practice can only perpetuate the impression of mobile homes as a second class form of housing. By giving the homes more exposure there is more chance that pride will be taken in ownership and that the public in general will accept the manufactured home as an acceptable form of housing in their area. Naturally the quality and appearance of the home itself is equally as important as the planning and landscaping. Older mobile homes/trailers should not be allowed in new subdivisions.

3.2 Mobile Home Costs and Standards

In a study conducted by Reed Management Consulting called "The Mobile Home in Alberta" in October 1982, it was concluded that price ranked as one of the most important criteria for consumers considering this type of home. The same study also found that the factory price of a manufactured home averaged $270.00 per square metre compared to $430.00 per square metre for a site built home while the delivered and set up price of a manufactured home (including dealer mark-up) averaged $380.00 per square metre. The above comparison excludes land costs.

The foundation and set-up costs can be significant and anchorage systems are presently being studied by both CSA and the manufactured housing associations. No definitive conclusions have yet been reached, but the aim is to arrive at a balance between economy and sound engineering practice.

It is our contention that foundation and anchorage designs should be more site specific to achieve economy. Areas where soils are not frost susceptible and wind and snow loads are low should allow more economical foundation and anchorage schemes. Alternatively, areas with poor soils conditions will require more elaborate foundations. The second phase of this study will deal in more detail with an examination of potential cost savings in foundation and anchoring systems.

Mobile Home Parks

The standards for utilities within mobile home parks are less restrictive than for typical municipal standards. In rural areas, the developer is left much to his own devices to design utility installations, the main jurisdiction lying with the Alberta Planning Code. Unless properly designed and installed, some of the more rudimentary systems have resulted in high maintenance costs after a few years of operation.

In urban parks, the developer is allowed some flexibility in the design and installation of utilities but is required to provide minimum fire flows and access for emergency vehicles. To date, a comprehensive standard guideline for mobile home park servicing has not been established.

The second part of this study will attempt to establish design guidelines which, while achieving economy in capital construction, will also ensure a low maintenance and trouble free system.

Mobile Home Subdivisions

At present, utilities in subdivisions are being built to the local municipal standard. The main reason for this is that the municipality will be responsible for taking over, operating and maintaining the utilities. The cost of a developed lot in this instance, becomes equivalent to a similar size lot for site-built housing.

Representation is presently being made, by such groups as HUDAC and UDI, to the larger municipalities in Alberta, and indeed throughout Canada, for municipal authorities to re-evaluate the ever-increasing standards which are being set. This representation is being done in an effort to reduce development costs for single family housing. The same arguments can apply for mobile home subdivisions.

It is beyond the scope of this report to examine municipal standards throughout Alberta. The second part of the report will, however, zero in on those items in utility design in which cost savings can be affected without sacrificing quality.

THE MANUFACTURED HOUSING ALTERNATIVE

PART II - DESIGN DEVELOPMENT STUDY

section 1.0

PART II - DESIGN DEVELOPMENT STUDY

1.0 DESIGN OBJECTIVES

This portion of the report will deal with the development of design objectives which might allow practical plans for manufactured housing communities that can be innovative and allow high levels of amenity while remaining cost effective. Design considerations and objectives will be discussed first, and then applied to a specific site used as an example. The site is 11.5 hectares (28.5 acres) and is located on the north-west corner of 39th Street and 30th Avenue in Red Deer.

1.1 Site Planning

The first part of the report, in reviewing and assessing existing mobile home developments, revealed some of the pitfalls in site planning for the mobile home. Site design considerations which affect overall quality are as follows:

a) Long lengths of straight roads, combined with similar setbacks and similar homes create undesirable monotony.

b) On-site landscaping is particularly important in mobile home developments.

c) Gross density of mobile home developments should be limited to 17-19 units/hectare (7-8 units/acre).

d) Street layout and arrangement of homes relative to the street is of critical importance in a mobile home development.

e) Planning for the mobile home development should not stop at the street, but complete the picture by setting the driveway location and the home location and orientation.

f) Mobile home communities benefit greatly from a centrally located club house and recreation facilities. Ten percent of the land available should be set aside for this purpose.

g) Mobile home developments should provide a recreational vehicle storage area with a minimum of one space for every ten homes.

h) Park development should allot at least 10% of the spaces for double-wide homes (depending on market conditions).

i) Parks for family markets should provide adequate tot-lots and play areas in addition to central park facilities.

j) A minimum of two car spaces should be provided in each driveway if on-street parking is not allowed. It is recommended that on-street parking not be allowed.

k) Each home should have a minimum privacy area of 50 square metres (540 square feet).

l) Reduction in the height of foundation and skirting will enhance the appearance of the mobile home.

1.2 Servicing and Engineering Standards

This section will examine the standards and level of municipal services applied to mobile home developments. The problems identified in the first phase report were, briefly stated, as follows:

1. For private mobile home park developments there are no comprehensive design guidelines or construction standards, often resulting in poor servicing quality and high maintenance costs.

2. For mobile home subdivisions, the standards applied are the local municipal standards and these very often result in high capital costs.

The aim of this section therefore, will be to attempt to derive a broadscope design guideline which, while achieving economy in capital construction costs, also produces a relatively low maintenance system. The method adopted was to examine each major item of municipal services in turn, and generate ideas for capital cost savings and maintenance reductions. These ideas were then applied to a specific development proposal and tested for cost effectiveness in comparison with a conventional design scheme.

The major items examined were as follows:

- Roadways
- Stormwater Drainage
- Waterworks
- Sanitary Sewers
- Shallow Utiliites (Electrical, Gas, Telephone, etc.)
- Street Lighting
- Service Connections

1.3 Roadways

Three main roadway classifications were examined with respect to mobile home developments. It was felt that the majority of mobile home developments are not normally large enough to warrant any roadways larger than a collector standard. The three classifications examined were:

Collector Road:	1000-5000	vehicles/day
Local Road:	100-1000	vehicles/day
Dead-End Road:	0-100	vehicles/day

Roadway design experience and literature indicate that no significant savings have been generated by the use of alternate materials. Concrete surfacing has been used widely on highway designs but has been rarely economical for local streets except in some isolated special cases. The use of paving bricks for dead-end streets has been applied in England with some success. This method is labour intensive and the capital costs are generally higher than asphaltic surfaces. Further, in the Canadian situation, frost heaving creates a greater maintenance problem with the use of paving bricks.

The conclusion arrived at with respect to materials for road construction is that the traditional method still offers the most reliable and economical road structure at this time. This method generally applies the following type of structure, with variations to suit local conditions:

150 to 300 mm	granular sub-base course
100 to 150 mm	crushed gravel base course
50 to 100 mm	asphaltic surface

The remaining area in which cost savings can be effected in roadways is in the width of the carriageway itself. Indirect savings also result, in terms of land-use efficiency, by reductions in the width of right-of-way (R.O.W.)

Numerous studies have shown that reductions in carriageway and right-of-way widths can be implemented without any undue hardships suffered by the user or the residents. In addition to cost savings, other beneficial effects have been observed:

- no on-street parking provides greater safety for children and emergency vehicles,
- narrower pavements allow more area for boulevards and plantings,
- greater sense of community is observed in more attractive and human scale surroundings.

The following table depicts the current practice in design of roadway widths. It presents the City of Red Deer Design Guidelines; maximums, minimums and averages of the literature reviewed on the subject (Ontario, Manitoba, Alberta and British Columbia); and our recommendations applied to mobile home developments.

TABLE 4

COMPARATIVE STATISTICS: ROADWAY STANDARDS

	Collector Road	Local Road	Dead End
R.O.W. Width (in metres)			
City of Red Deer	22	16	16
Literature (maximum)	24	20	20
Literature (minimum)	15	6	5
Literature (average or most widely used)	20	15	12
RECOMMENDED	20	14	8
Pavement Width (in metres)			
City of Red Deer	12	10	10
Literature (maximum)	15	15	10
Literature (minimum)	8	7	5
Literature (average or most widely used)	10	8	7
RECOMMENDED	10	7	6

Collector road standards do not vary a great deal and the most widely used widths are a 20 metre right-of-way with a 10-metre pavement width for two driving lanes and paved shoulder. It is recommended that this standard be adopted for mobile home developments. As most mobile home developments are not large enough to warrant collector roads within them, savings realized from width reductions would be minimal.

Local road width standards vary considerably from area to area. In a laneless mobile home development with front driveways, it is suggested that on-street parking is not required and indeed, creates a nuisance as well as detracting from the overall appearance of the development. It is recommended that local roads be designed to a 14-metre right-of-way with a 7-metre pavement width for two driving lanes. Variations can be achieved by offsetting the pavement centreline, creating wide boulevards and sidewalks with ornamental landscaping and creating widenings at reasonable intervals for visitor parking.

Appendix IV details cost estimates for various road and right-of-way widths. An example of the cost saving in local road construction is as follows:

16 metre right-of-way/10 metre pavement	$239.40	per metre
14 metre right-of-way/7 metre pavement:	$179.90	per metre
saving	$ 59.50	per metre

On a typical size development with 1000 metres of local roadway, the projected saving is almost $60,000.00, or in the order of $300.00 per unit.

Dead end road widths also vary considerably from area to area. In a mobile home development, a dead-end road that serves 6 to 12 homes needs to be wide enough only to allow the units to be initially installed. It should also be wide enough to allow garbage collection, emergency vehicle access and storage of snow. Our research indicates that a road with an 8-metre right-of-way and a 6-metre pavement width can fulfill these functions. If the length of the road is limited to 100 metres and has some curvilinear characteristics it can result in a very attractive cluster of homes.

Again, the comparison of unit costs with a conventional cul-de-sac indicates significant savings as shown below:

16 metre right-of-way/10 metre pavement:	$239.40	per metre
8 metre right-of-way/6 metre pavement:	$138.80	per metre
saving	$100.60	per metre

Using a development of 200 units with 1000 metres of dead end roads, the projected saving is almost $100,000.00, or in the order of $500.00 per unit.

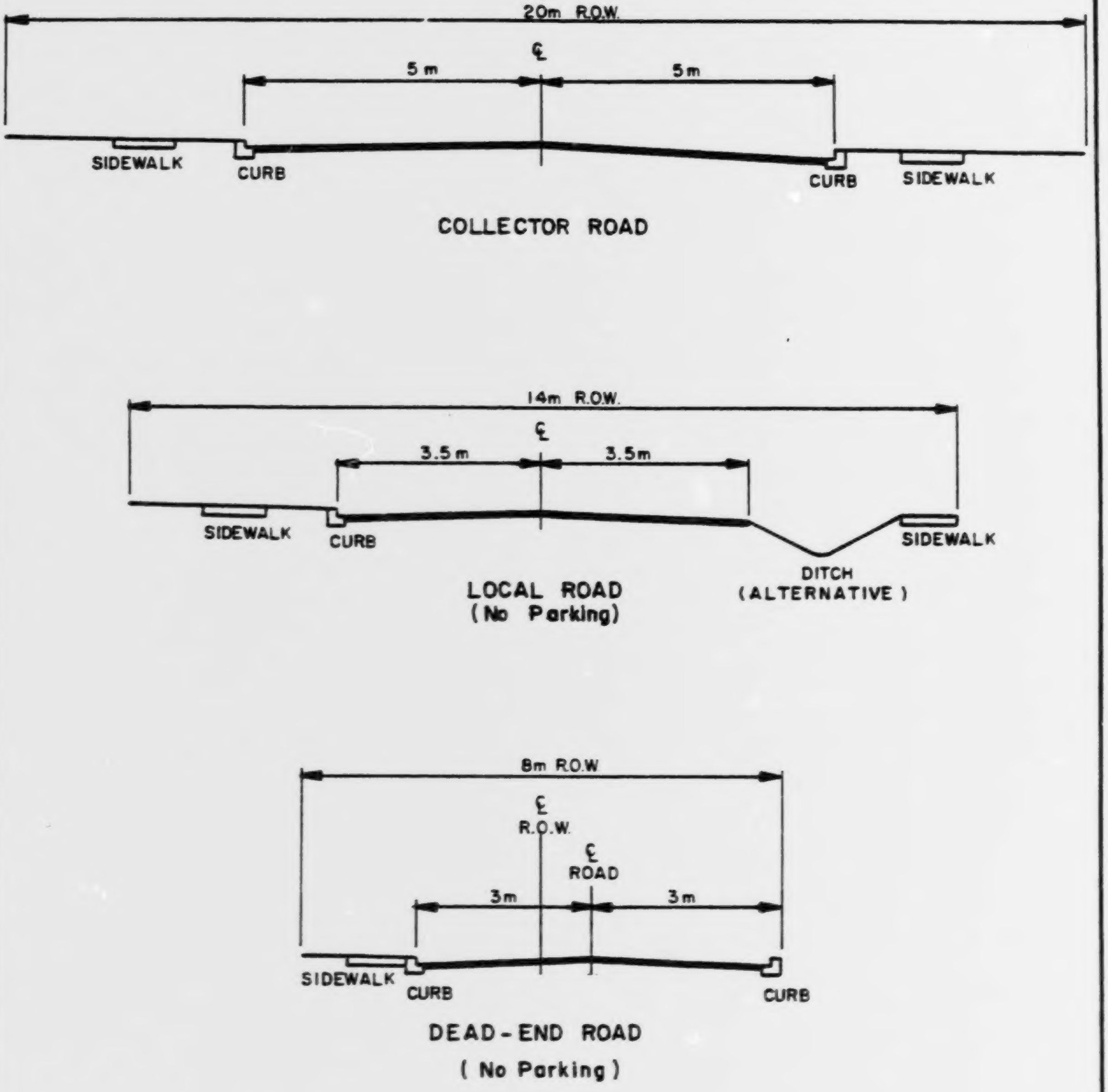
The conclusion from this portion of the analysis is that roadway widths can be reduced and still maintain a high level of service while achieving significant cost savings. The recommended design guidelines for mobile home developments are as follows:

	R.O.W.	Pavement
Collector Road (1000-5000 veh/day)	20	10
Local Road (100-1000 veh/day)	14	7
Dead End Road (0-100 veh/day)	8	6

Figure 10 depicts the above proposed roadway sections for mobile home developments.

1.4 Storm Drainage

Present common municipal practice is to pipe all storm drainage up to a 5-year return frequency storm. Some municipalities have adopted a 2-year return storm for the piped system in order to achieve economy. Storm flows in excess of the 5-year return storm are generally routed overland on the streets and natural channels to the nearest available watercourse. If the watercourse is sensitive to increased runoff, then some form of retention or detention pond is used to decrease peak flows to the watercourse.



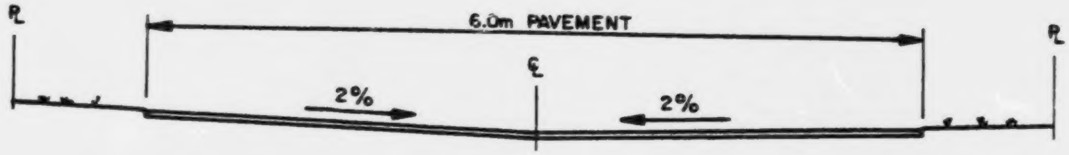
PROPOSED
ROADWAY WIDTHS

FIGURE: 10

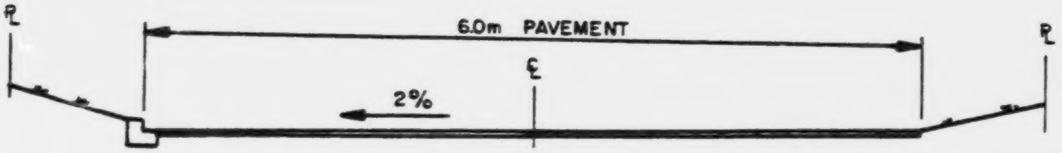
Storm drainage practice in private mobile home developments has been largely left up to the developer. In many cases no overall drainage plans are prepared and drainage problems are resolved as they occur by temporary ditches, sand bagging, etc.

The main objective in providing storm drainage should be to avoid damage caused to persons, dwellings or downstream watercourses by improper drainage. In order to achieve economy, temporary nuisance conditions such as water on the street, can generally be tolerated. The aim of the storm drainage system should be to provide adequate routing for the water while attempting to reduce the runoff from the development. Runoff is reduced to some extent by the provision of narrower pavements as discussed in the previous section. Further, roof drains can be directed to discharge to grassed surfaces rather than to an underground piped system. Other means, such as roof water storage, are not particularly applicable to mobile homes.

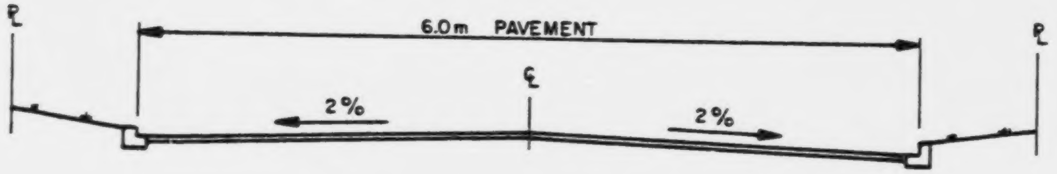
On dead-end roads savings can result by not providing a piped system. On a dead-end road of less than 100 metres in length and a 6 metre pavement width, it is calculated that storm drainage can be carried along the roadway without any adverse effects. This water can be directed to a piped system on the local road. Further, if the local road has very few frontages or driveway entrances, the drainage can be achieved by swales or ditches, thus eliminating any underground piping. Although curb and gutter on a local road makes for a neat and attractive street, shallow grassed swales, kept clean and trimmed, can also be attractive and less costly.



CENTRALLY DEPRESSED PAVEMENT



CURB & GUTTER ON ONE SIDE ONLY



CURB & GUTTER ON BOTH SIDES

DRAINAGE ON
DEAD-END ROADS

FIGURE:
11

The cost savings that can be realized per 100 metre length of street are as follows:

100 metre long street section

With storm sewer:

100m of 300mm diameter pipe @ $85 =	$ 8,500
2 catch basins and leads @ 1500 =	3,000
200m of curb & gutter @ $30 =	6,000
1 manhole @ 2000 -	2,000
	$19,500

Without storm sewer:

The entire cost can be eliminated, or the developer may wish to have curb and gutter on both sides ($6,000) or on one side only ($3,000).

Figure 11 depicts some possible variations in street sections for surface drainage. The centrally depressed pavement section is acceptable for short dead ends and with a reasonably steep longitudinal gradient (greater than 1%). On flatter gradients the centrally depressed pavement is not recommended as it tends to keep water on the roadway and possibly damage the substructure.

On dead-end roads, the superelevated section with curb on one side only, appears to offer a good compromise on quality and economy in most instances. Depending on topography however, the traditional crowned roadway may be required.

For local roads, the centrally crowned roadway is recommended. Surface drainage can flow along the curb or into swales as shown. If curbs are provided, then catch basins to a storm sewer will be required at approximately 150 metre intervals (depending on local rainfall conditions). Sometimes catch basins can be discharged to nearby natural drainage channels if available, thus reducing the quantity of storm sewer.

General recommended guidelines are as follows:

1. For short dead-end streets no storm sewer is required. Drainage routing should be along the right-of-way. Curb and gutter makes for a neater and more attractive streetscape and should be included if budget allows.

2. For local streets, drainage should be provided by storm sewer if the roadway has curb and gutter. For economy, side swales can be utilized provided they are adequately constructed and maintained. Local streets should be centrally crowned.

1.5 Waterworks

Currently available design guidelines allow for a water consumption of approximately 700 litres/unit/day to 800 litres/unit/day. Measured consumption in several privately owned mobile home parks indicates the following range of unit water consumption:

Winter Range:	300-400 litres/unit/day
Summer Range:	400-650 litres/unit/day

Consequently savings can be made in the provision of the average daily supply. Lower figures can be used if the park is to be strictly a retirement community as opposed to a family-oriented development.

The sizing of the water distribution system will in most cases, be determined by fire flow requirements, and the minimum pipe size for fire flow is 150 mm diameter. Cluster housing concepts, however, can allow for the use of reduced pipe sizes, as will be shown in Section 2.3.

Hydrant coverage is generally taken as a 75-metre radius. Modern firefighting equipment can cover up to a 150-metre radius from one hydrant. Consequently, if a hydrant is available at the start of a dead end street, and provided the furthest housing unit is less than, say, 100 metres from the hydrant, the water line on the dead-end street could be sized for domestic consumption only. If there are 12 to 15 units on this street, the water line could be made as small as 50 mm in diameter. The saving in pipe cost and installation cost over a 150 mm diameter pipe, is approximately $20.00 per metre. A blow off can be provided at the end of the line for occasional cleaning, and also act as an emergency source for fire-fighting.

Watermains must be laid below the frost line to prevent freezing. The use of insulated pipe and insulated trenches has been attempted but has not generally resulted in savings. In special cases, where trenching is difficult (through rock or muskeg), insulated pipe can be more economical. When snow cover is predictable, watermains may be laid to a shallower depth in a grassed boulevard where snow is not removed and the depth of frost is not as great as under the roadway.

The use of double water service connections has been tried and found to be successful both from economy and operation. This involves using a 25 mm service line and branching off to two 20 mm lines, one to each unit. This has economies in that a single trench is required for every two units. It is estimated that this method could save approximately $150 per unit.

In general, the following guidelines are suggested.

1. Average daily domestic flow design: 500 litres/unit/day.
2. Minimum size of disribution mains: 150 mm diameter.
3. Minimum size on dead-end streets less than 100 metres in length: 50 mm diameter.
4. Hydrants at entrances to dead-end streets.
5. Minimum hydrant linear spacing on local streets: 150 metres.
6. Blow offs recommended at ends of 50 mm dead-end lines.
7. Minimum depth of bury: to local frost penetration.

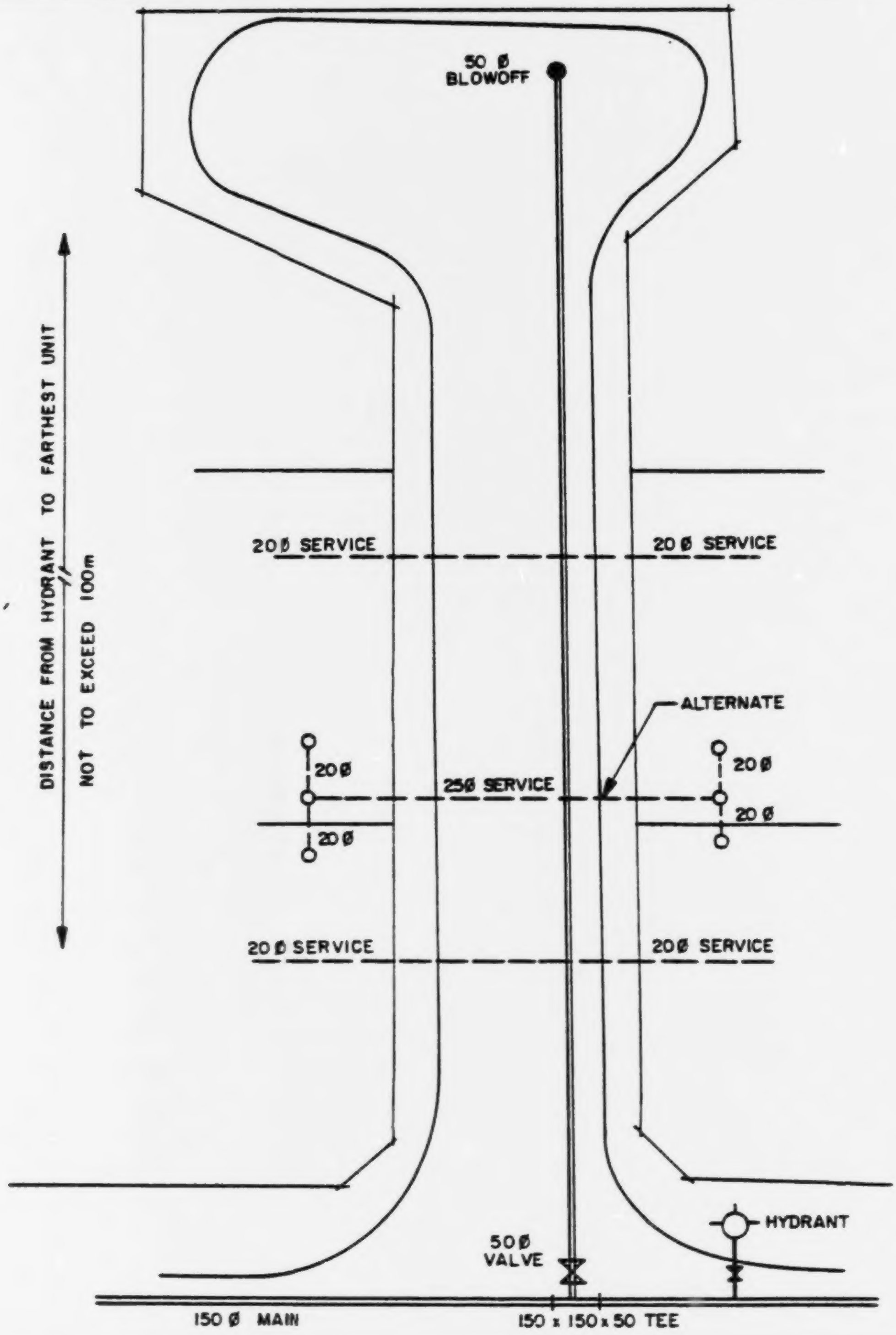
Figure 12 depicts some of the examples discussed above.

1.6 Sanitary Sewers

Present municipal practice is to specify a minimum 200 mm diameter pipe regardless of area served. Some municipalities require a minimum 250 mm pipe. Gradients for each size of pipe are generally specified to maintain a minimum 0.75 m/sec full flow velocity in the pipe (to achieve self-cleaning action).

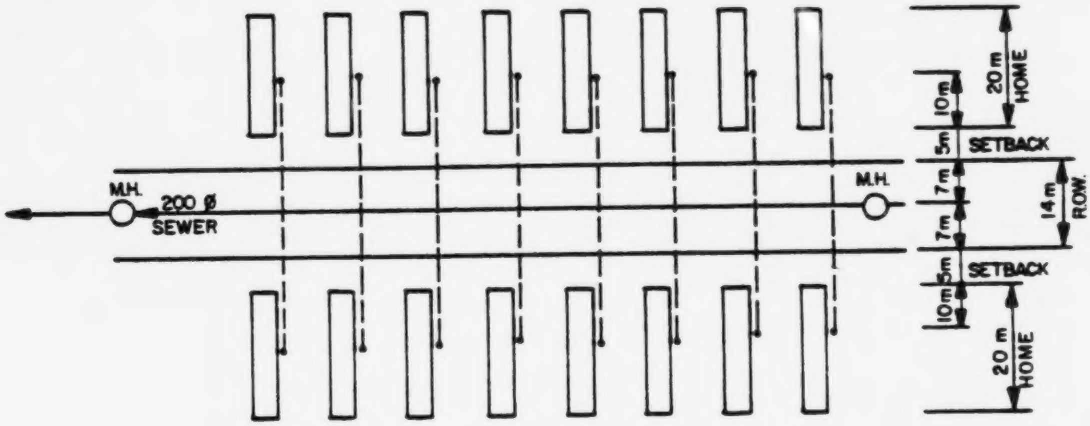
Most mobile home developments have used a 150 mm pipe collection system with varying gradients. Many parks have installed the sewer line underneath the homes in an effort to cut costs. If manholes are placed at either end so that the line can be properly rodded when plugged, this can be acceptable practice. If the line has to be dug up for repairs, however, the homes must be moved. Generally, it is not considered desirable to run buried pipes underneath a series of structures.

Figure 13 depicts the typical saving that is made by installing sewers under the homes. The saving over a 100 metre length of roadway is approximately



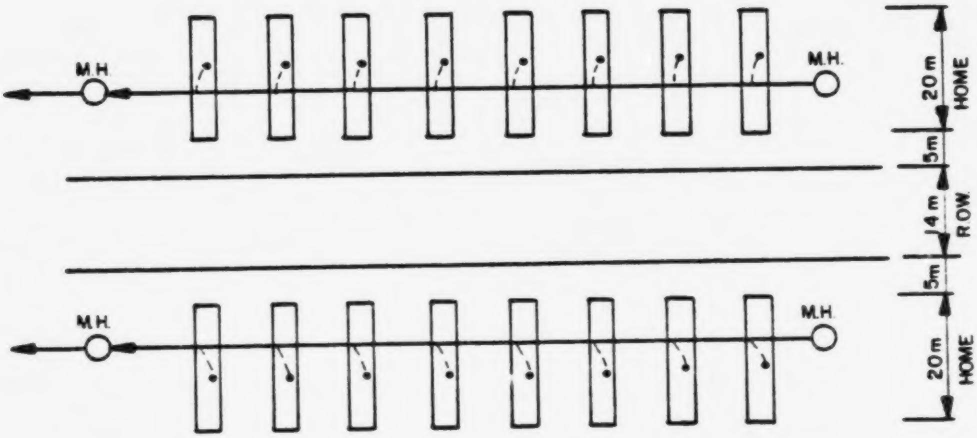
PROPOSED WATERMAIN
ON DEAD - END STEET

FIGURE
12



SEWER IN ROADWAY

100m of 200 Ø @ 70.00 = 7,000
16 x 22m = 352m of 100 Ø @ 50.00 = 17,600
2 MANHOLES @ 2000.00 = 4,000
$ 28,600



SEWER UNDER HOMES

200m of 200 Ø @ 70.00 = 14,000
16 SERVICE CONNECTIONS @ 200.00 = 3,200
4 MANHOLES @ 2000.00 = 8,000
$ 25,200

ROADWAY vs UNDER
HOME COMPARISON

FIGURE: 13

$3,500.00. If the roadway is narrower, the length of services is reduced and this method begins to lose its' cost advantage. In a cluster layout, running the sewer under the homes has little or no advantage.

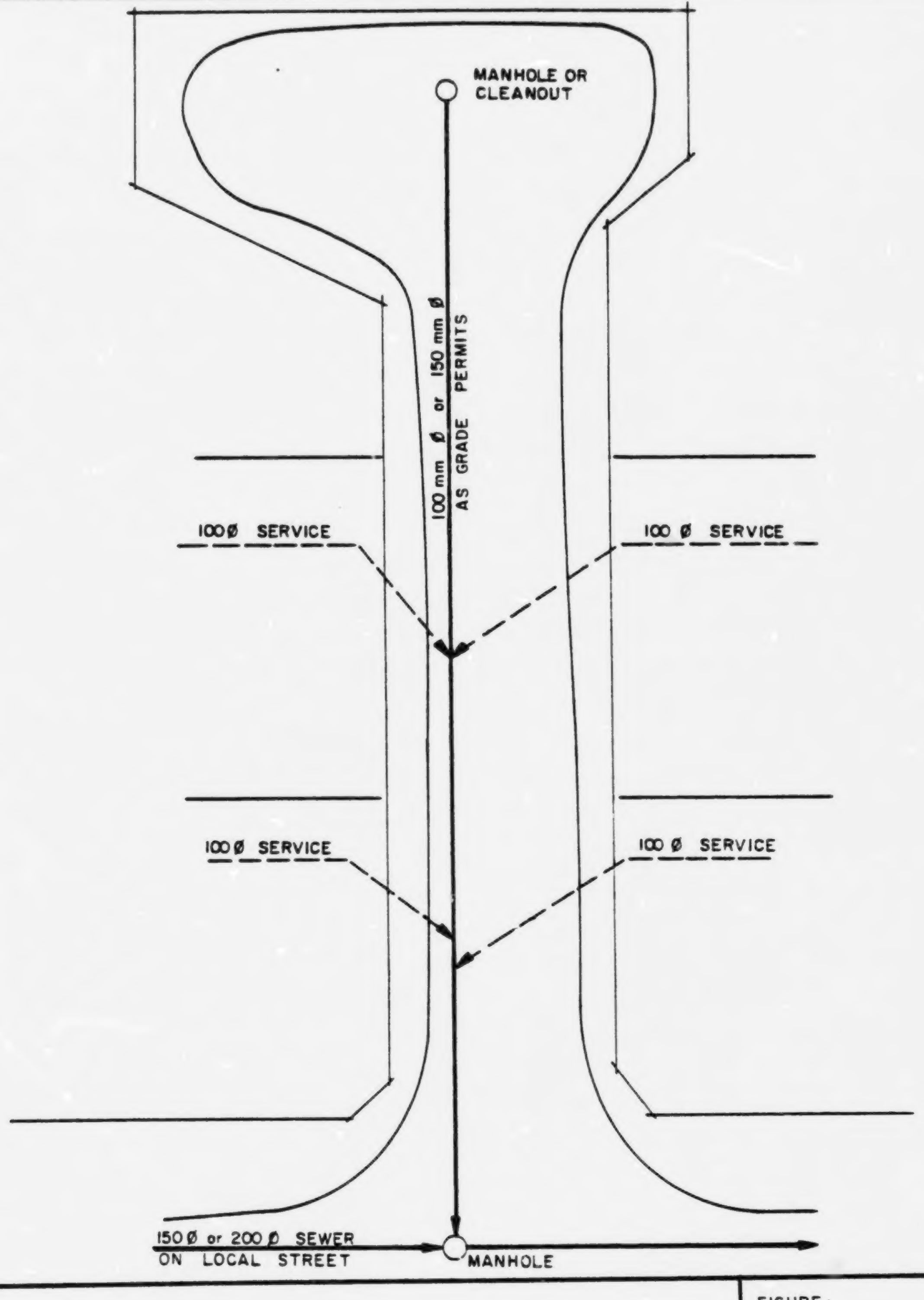
A cluster layout with short dead-end streets can offer some cost savings for sanitary sewers. For 12 to 15 homes a 100 mm diameter pipe can be used provided a proper gradient can be achieved. A manhole can be used on the end of this line if several homes need to connect. Otherwise a simple cleanout should suffice.

The difference in pipe price between a 100 mm pipe and a 150 mm pipe is approximately $3.50 per metre. Installation cost would create a further saving of $3.50 per metre, for a total reduction of $7.00 per metre. For a 100-metre length of dead end road this would represent a saving of $700.00. Figure 14 depicts a proposed installation on a dead-end road.

Sanitary sewage flows have not been measured on any of the parks studied. However, they are related to water consumption and are generally slightly less as some water is lost to sprinkling. This water is generally made up by infiltration however, and it is recommended that an average daily flow of 500 litres per unit be used for design.

Curvilinear sewers have been used for economy in more modern street layouts. This is generally acceptable as long as the deflection in each joint does not exceed the manufacturer's recommended deflections.

There have been attempts to use double service connections for sewers. In most instances these have not been successful since if a service becomes plugged it is difficult to determine its' source. This can be overcome by the provision of a small inspection chamber where the individual services come together. The extra cost of this chamber almost negates any cost savings.



PROPOSED SANITARY SEWER
ON DEAD-END STREET

FIGURE: 14

However, double sewer service connections may have applications in special instances. Greater savings can be achieved by placing the sewer and water service leads in the same trench and this has been done quite often on conventional subdivisions without adverse problems.

Gravity sanitary sewers do not need to be as deep as watermains as freezing is not usually a problem. This can be used to some advantage in the case of mobile homes since they do not ordinarily have basements. For structural reasons and to reduce risk of freezing, the minimum depth of cover on roadways should be 2 metres.

General recommendations for mobile home developments are as follows:

1. Sanitary sewers running directly under homes are acceptable in a private park development, but not desirable for a municipally-operated development.

2. 100 mm diameter sanitary sewer may be used on short (less than 100 metres) dead end roads provided adequate gradient can be achieved.

3. Local roads should use a minimum 150 mm diameter pipe.

4. A 200 mm diameter pipe should be used when more than 500 units are served or when a flatter gradient offers economy.

5. The following minimum grades should be used:

Sanitary Sewer	Desirable	Absolute Minimum
100 mm pipe	1.5%	1.0%
150 mm pipe	0.8%	0.5%
200 mm pipe	0.5%	0.35%

6. Curvilinear sewers are permitted within the manufacturer's recommended deflections on each joint, and only one horizontal or vertical curve should be used between manholes.

7. Manhole spacing should be related to the reach of rodding equipment locally available. Modern power rodding equipment can generally reach up to 200 metres, with some special equipment reaching up to 300 metres. For private parks, a reasonable average spacing would be in the order of 175 metres.

8. A whole range of pipe materials are commonly used for sewers. Any can be used successfully if the pipes are properly bedded, laid and backfilled. Because local soil conditions and type of pipe used vary considerably, it is difficult to evolve an overall standard. Each particular insallation should give due consideration to the native soil type and be designed to ensure a properly bedded pipe, minimum trench settlement, and minimum infiltration.

1.7 Shallow Utilities

Electric power, telephone, cable TV and natural gas supply are normally designed and installed by the particular utility company in the area. Consequently no significant savings are envisioned.

The one area where economies may be achieved is the use of overhead power and telephone services. The cost of overhead services is generally less than half of the underground servicing cost. Overhead services have been abandoned in most modern subdivisions because of aesthetics. Aesthetics are particularly important in mobile home developments. Consequently it is felt that any savings achieved by the use of overhead power would be negated by reduction in the overall value and appearance of the development.

In specific cases, where contour and tree cover could be effectively used to shield overhead services, it can be considered.

Maintenance costs can be reduced to some extent by locating shallow utilities in boulevards, thus eliminating the need for re-surfacing when lines need repairs.

1.8 Street Lighting

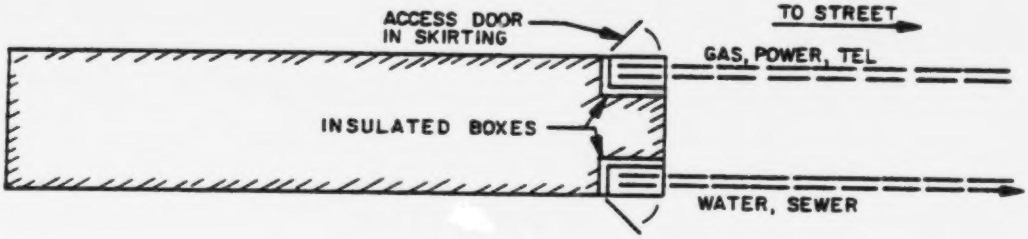
In the case of managed mobile home parks, the level of street lighting need not be as nigh as the normal subdivision requirement. Most parks visited used a low lamp post at regular intervals and this was found to be successful.

With a clustered type of layout low lamp-posts can be used at each intersection and at the ends of each dead-end road. Effectively this would reduce the cost of street lighting from the current average of $20.00 per metre to approximately $12.00 per metre. It should be ensured that the lamp-posts are sturdy enough to withstand minor traffic damage.

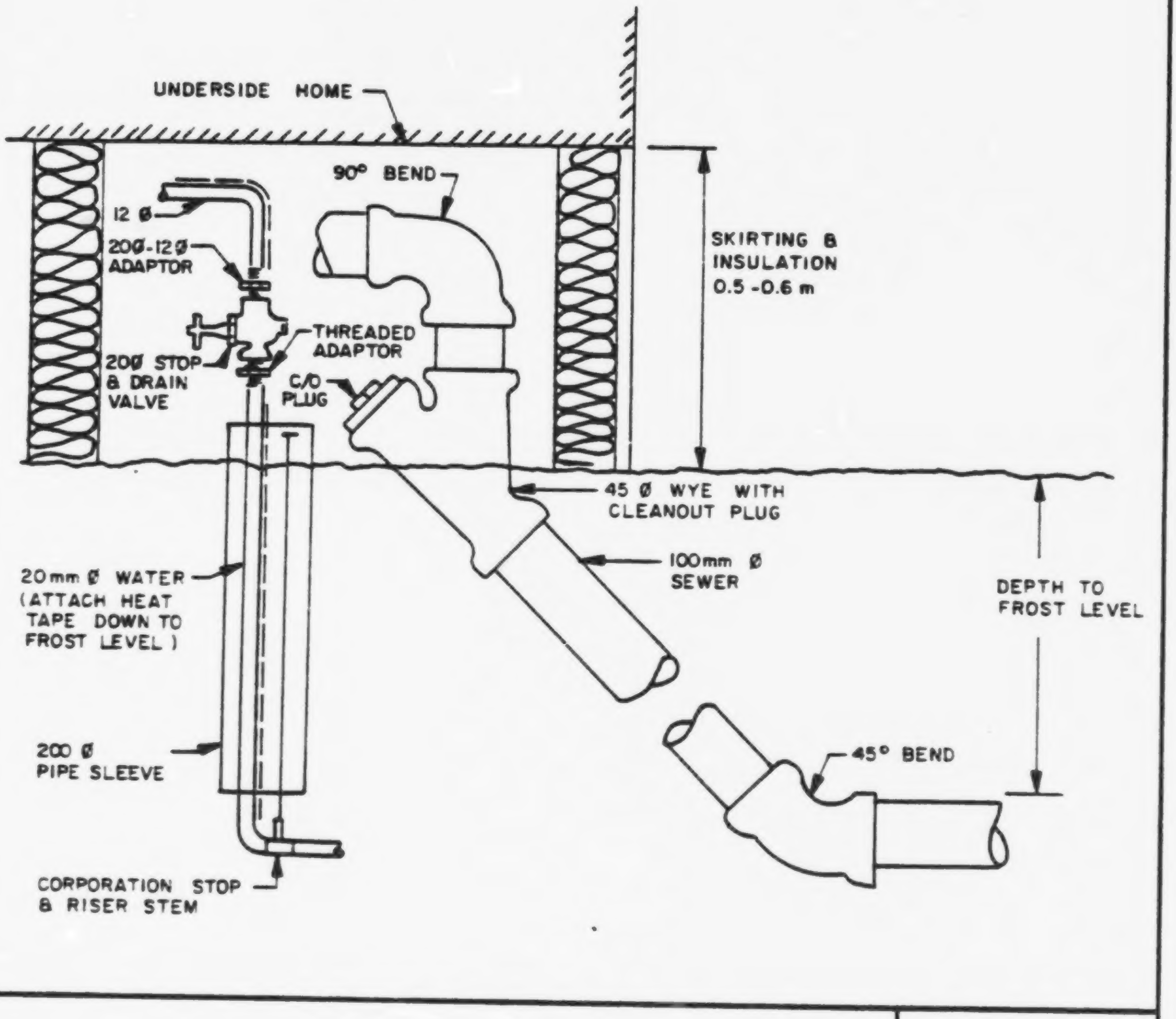
Studies have shown that direct energy savings are possible with the use of high pressure sodium street lights and replacement of the mercury vapour street lights. Power consumption in most examples was cut in half by the use of high pressure sodium lights.

1.9 Service Connections

Observations of mobile home developments show that most homes are placed in the order of 1 metre above the ground level. This is generally done to allow access to connect the utilities to the underside. However, this method tends to exaggerate the appearance of the home as tall and narrow. A few developments have been successfully carried out with the home at 600 mm above the ground level. These developments (combined with shrubbery planting around the skirting) certainly give the homes a lower and more attractive profile. It is suggested that if internal plumbing within the home is brought to one edge, utility service connections could be made more easily from the side. This could always be accessed by a doorway in the skirting. Figure 15 indicates how this can be done. By reducing the necessity for working or access underneath the home, the unit can be placed as low as 0.5 metre above the ground. The cost of skirting is consequently reduced and the home ends up with a low profile and more attractive appearance.



PREFERRED LOCATION FOR SERVICE BOXES



PROPOSED SERVICE BOX CONFIGURATION

FIGURE 15

section 2.0

2.0 CONCEPTUAL DESIGNS AND COMPARATIVE COSTS

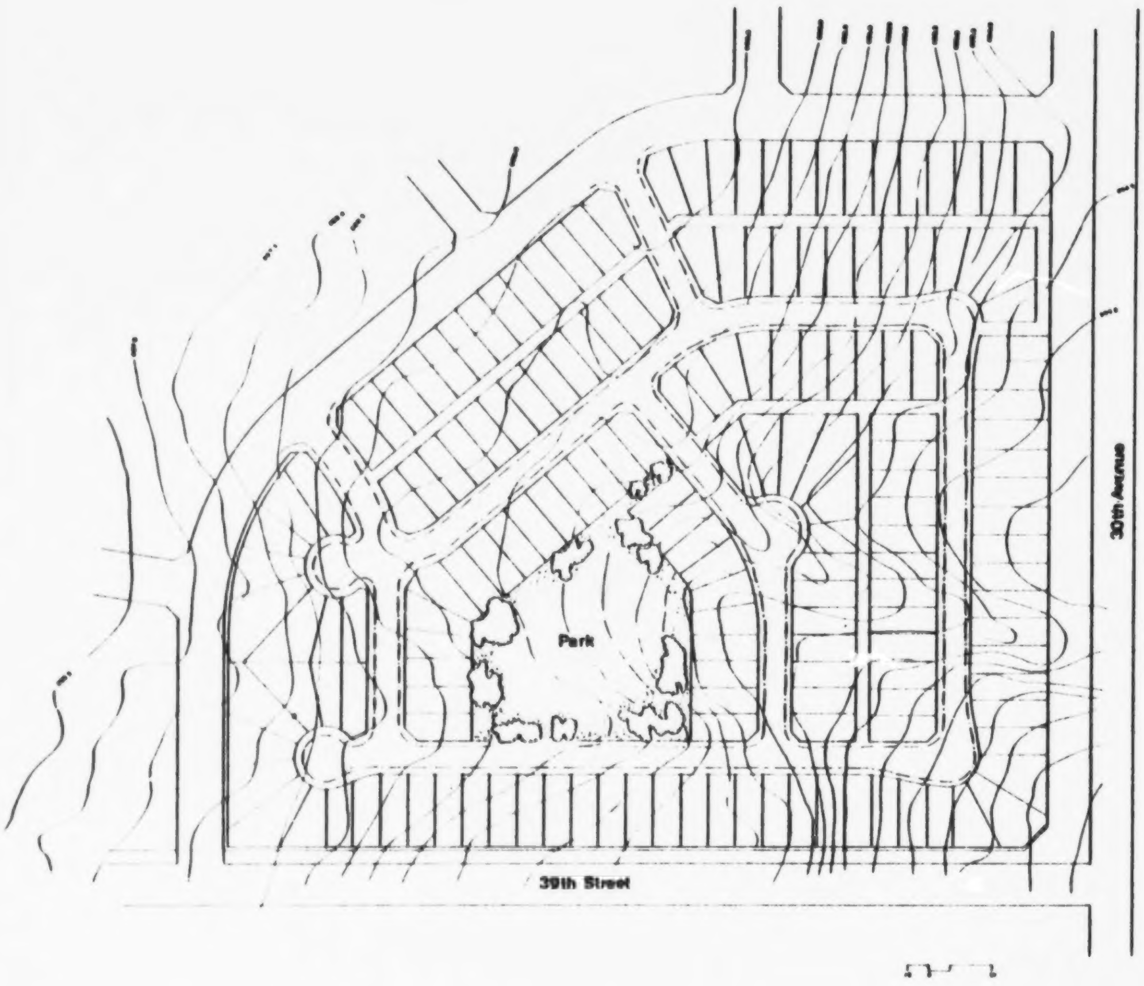
The objective of the conceptual planning phase of the study is to develop a practical plan for a manufactured housing park which is innovative, cost effective and provides potential high levels of amenity. For this planning exercise an 11.5 hectare (28.5 acre) site has been selected. The site is located on the N.W. corner of 39 Street and 30 Avenue in Red Deer. It is important to stress that the site is being used to test planning concepts and it is not the intent at this time to proceed with formal approvals or construction of a manufactured housing community in this location.

For comparative purposes three plans have been prepared.

2.1 Traditional Subdivision Layout

Figure 16 presents a traditional subdivision layout based on the existing approved plan for the land parcel. Minor modifications have been made to eliminate the multi-family site and introduce a park area equivalent to approximately 10 percent of the site area. These modifications were done so that that traditional design could be reasonably compared with the alternative manufactured housing concepts.

Figure 16 is based on a standard small lot (13 metre) subdivision with some frontage permitted on the adjacent 22 metre collector road. The streets and utilities are designed to City of Red Deer Standards. This design has the highest proportion of roads to developable land and ultimately the highest road and servicing costs. The lot yield was also the lowest of the designs developed in spite of the fact that the layout has no recreational vehicle storage, minimal buffers, less open space and lots fronting the exterior collector road. Figure 17 presents the utilities and development costs for this traditional design.



legend/notes

LAND USE	AREA		% OF GROSS DEVELOPABLE
	HECTARES	ACRES	
GROSS DEVELOPABLE	11.72	28.96	100
PARK	0.93	2.30	8
BUFFER	0.17	0.42	1
R.V. STORAGE	0	0	0
ROADS 16 m R/W	2.23	5.51	
LANES 6m R/W	0.38	0.94	
TOTAL ROADS/LANES	2.61	6.45	22
NET DEVELOPABLE	8.01	19.79	68

# SINGLE LOTS	170
# DOUBLE LOTS	0
TOTAL # OF LOTS	170
GROSS DENSITY	14.50 units/ha. (5.87 units/ac)
NET DENSITY	21.22 units/ha (8.59 units/ac)

contour interval 0.50 m

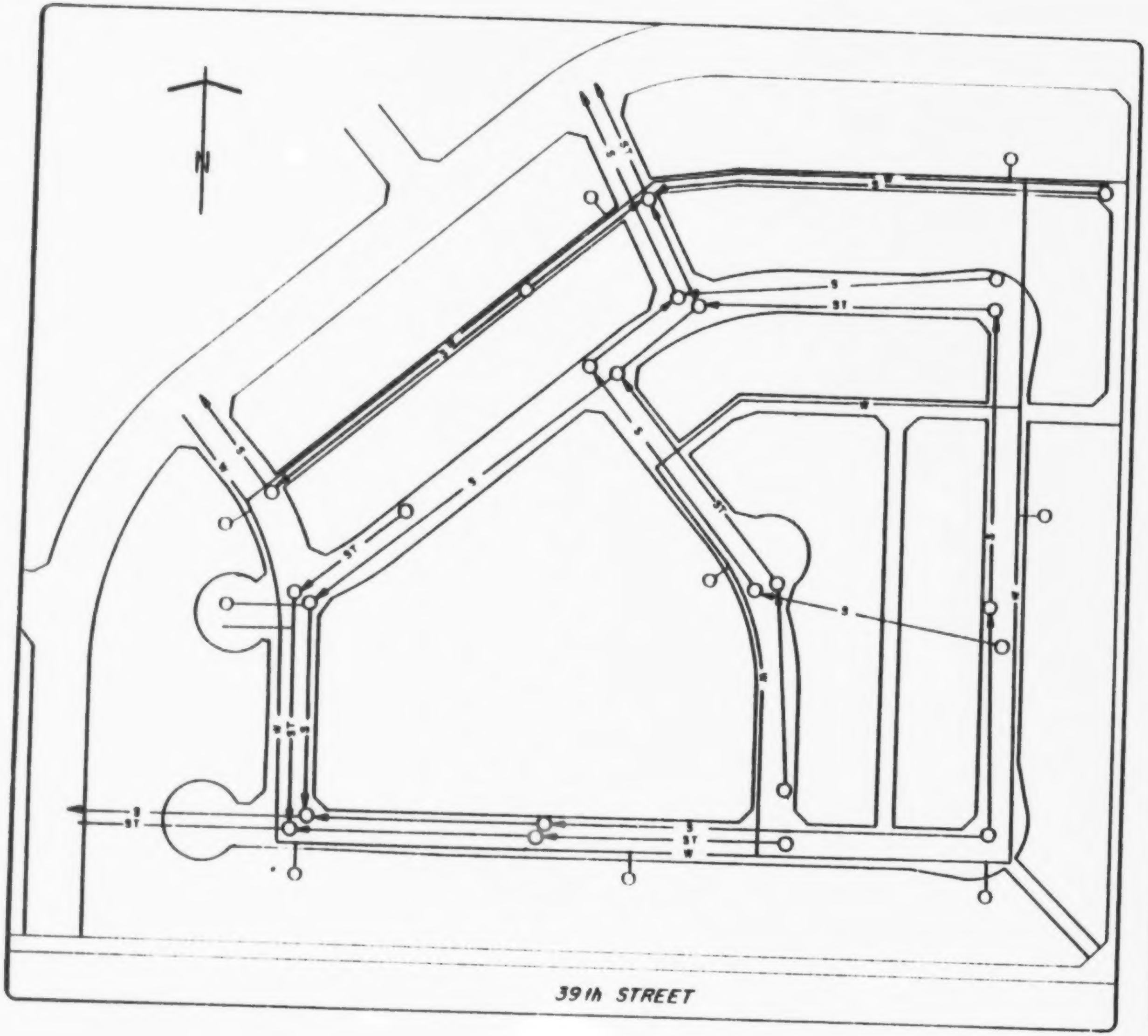
Manufactured Housing Association
Red Deer, Alberta

TRADITIONAL
SUBDIVISION LAYOUT

figure

16

DeLCan



ESTIMATED COSTS

16m ROW/10m P 1300m @ 239.40	$311,220
Lanes - 6m 550m @ 100.00	55,000
300ø - 890m @ 85.00	75,650
Manholes 10 @ 2,000	20,000
Catchbasins 20 @ 1,100	22,000
250ø 290m @ 75.00	[illegible]
Curb & Gutter 2600m @ 30.00	78,000
150ø - 1630m @ 65.00	105,950
Hydrants - 9 @ 2,500	22,500
150ø valves 14 @ 500	7,000
150ø Fittings 10 @ 200	2,000
20ø Service 3740m @ 20.00	74,800
200ø - 1650m @ 70.00	115,500
Manholes - 14 @ 2,000	28,000
100ø Service 3740m @ 50.00	187,000
Nat Gas - 1630m @ 25.00	40,750
U/G Power & Tel - 1630m @ 25.00	40,750
St. Lighting 1300m @ 20.00	26,000
170 @ 150.00 170 @ 100.00	25,500 17,000
TOTAL	1,270,920

COST PER UNIT $7,473

Manufactured Housing Association
Red Deer, Alberta

SERVICES FOR
TRADITIONAL LAYOUT

figure
17

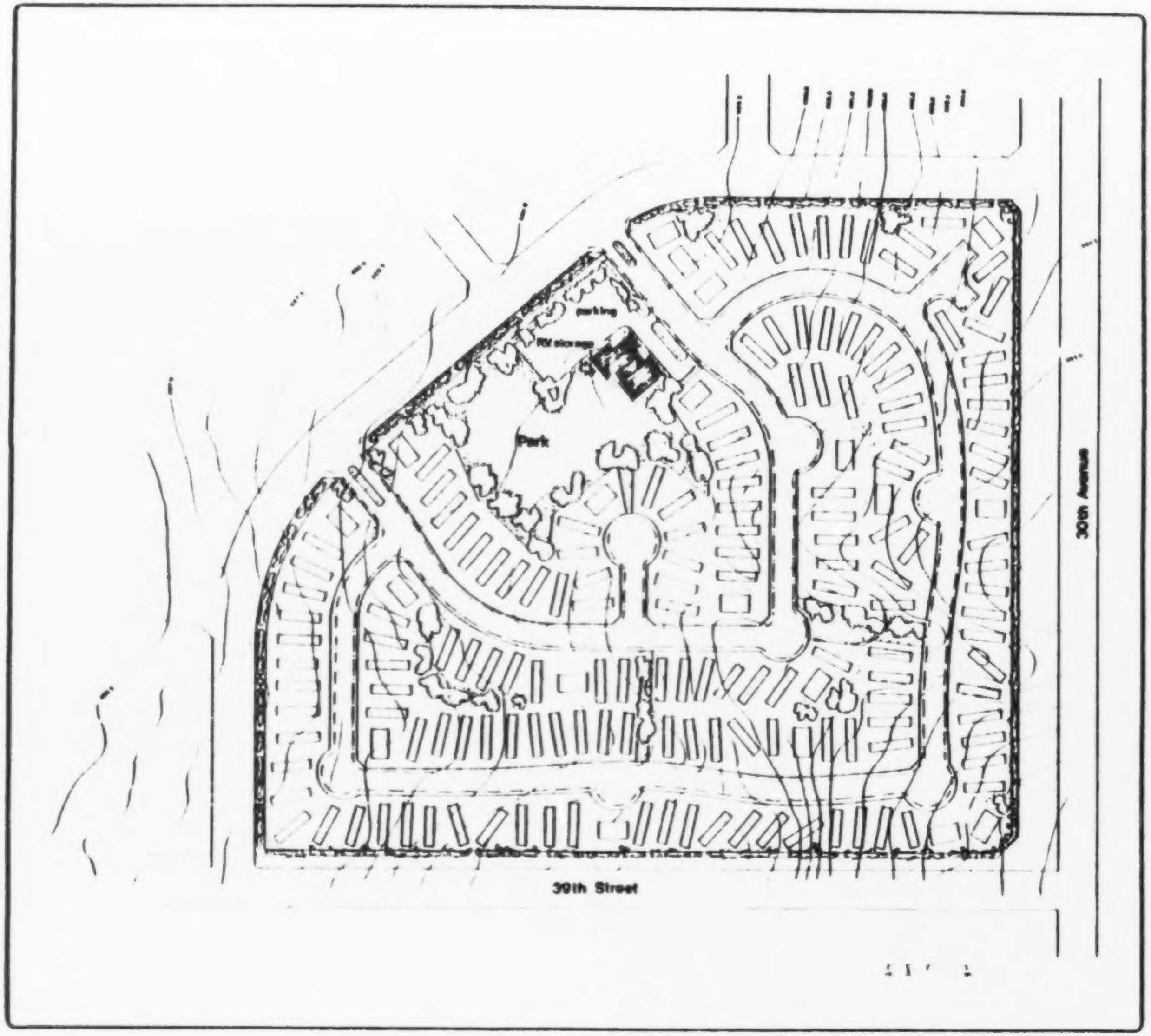
DeLCan

2.2 Modified Traditional Layout

Figure 18 depicts a design which is simple in concept and involves a modified grid road pattern with a more traditional row lotting concept. The intent of this plan is to show how, with minor modification, a linear street layout can produce an acceptable design with reasonably good efficiency. To minimize road lengths, cross streets linking the outer and inner loops have been minimized. However, to avoid the common problem of monotony on a layout of this type, gentle curves have been introduced into the street system and some variations have been introduced into the placement and orientation of the homes. Double wide units have also been sited in selected locations to provide visual relief to the end-on single wide units. Amenity is also improved by the small "eye-brow" bulbs which allow some variation in street-scape, home placement and landscaping. The need to provide variation in the layout of the streets and homes cannot be overemphasized when planning a community with manufactured houses.

A park and recreation area is provided with pedestrian access from all parts of the development. With a park of this size, the economics of a community building/club house is marginal but has been included to illustrate the design concept. The park is generally inward looking and surrounded by a landscaped buffer strip.

Because of the efficient street layout and slightly reduced road and engineering standards the design offers a lower cost per unit development than the traditional subdivision using equivalent lot sizes. Figure 19 presents the services and development costs for this design.



legend/notes

LAND USE	AREA		% OF GROSS DEVELOPABLE
	HECTARES	ACRES	
GROSS DEVELOPABLE	[illegible]	[illegible]	100
PARK	[illegible]	[illegible]	[illegible]
BUFFER	[illegible]	[illegible]	[illegible]
R.V. STORAGE	[illegible]	[illegible]	[illegible]
ROADS - 16 m R/W ROADS - 11m R/W	[illegible] [illegible]	[illegible] [illegible]	
TOTAL ROADS	[illegible]	[illegible]	[illegible]
NET DEVELOPABLE	[illegible]	[illegible]	67

SINGLE LOTS [illegible]
DOUBLE LOTS [illegible]

TOTAL # OF LOTS [illegible]

GROSS DENSITY [illegible] units/ha ([illegible] units/ac)
NET DENSITY [illegible] units/ha ([illegible] units/ac)

contour interval 0.50 m

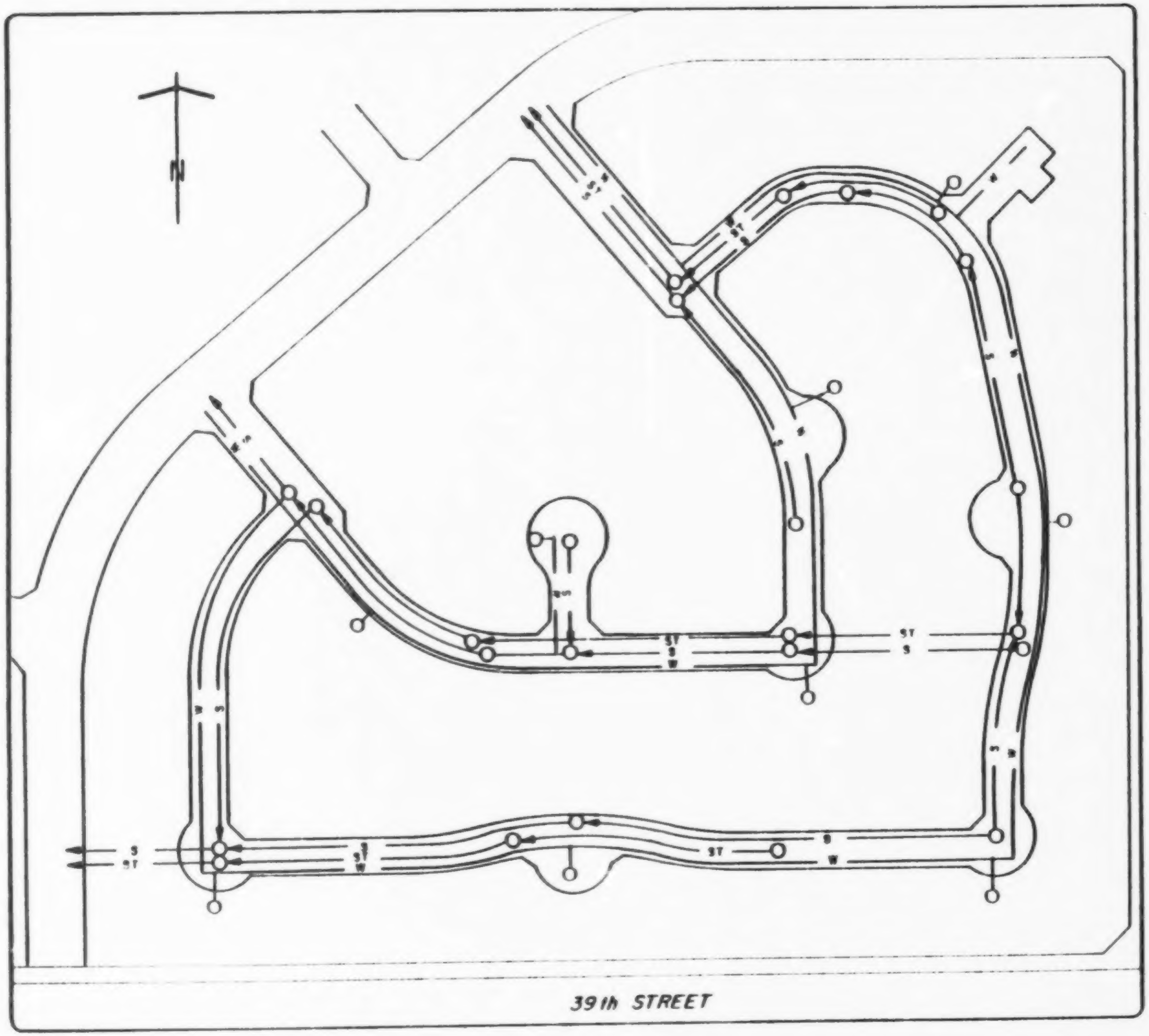
Manufactured Housing Association
Red Deer, Alberta

MODIFIED TRADITIONAL
SUBDIVISION LAYOUT

figure

18

DeLCan



ESTIMATED COSTS

16m ROW/10m P 120m @ 239.40	$28,728
10m ROW/7mP 1230m @ 179.90	221,277
300ø - 840m @ 85.00	71,400
Manholes - 10 @ 2000	20,000
Catch Basins 20 @ 1100	22,000
250ø - 200m @ 75.00	15,000
Curb & Gutter - 2500m @ 30.00	75,000
150ø - 1350m @ 65.00	87,750
Hydrants 9 @ 2500	22,500
150ø valves 11 @ 300	3,300
150ø Fittings 11 @ 200	2,200
20ø Service 3590m @ 20	71,800
150ø - 1350m @ 60.00	81,000
Manholes - 14 @ 2000	28,000
100ø Service - 3590m @ 50	179,500
Nat Gas - 1350m @ 25	33,750
U/G Power & Tel - 1350m @ 25	33,750
St. Lighting - 1350m @ 12.00	16,200
176 @ 150	26,400
176 @ 100	17,600
TOTAL	1,061,133

COST PER UNIT $6,029

Manufactured Housing Association
Red Deer, Alberta

SERVICES FOR MODIFIED TRADITIONAL LAYOUT

figure
19

DeLCan

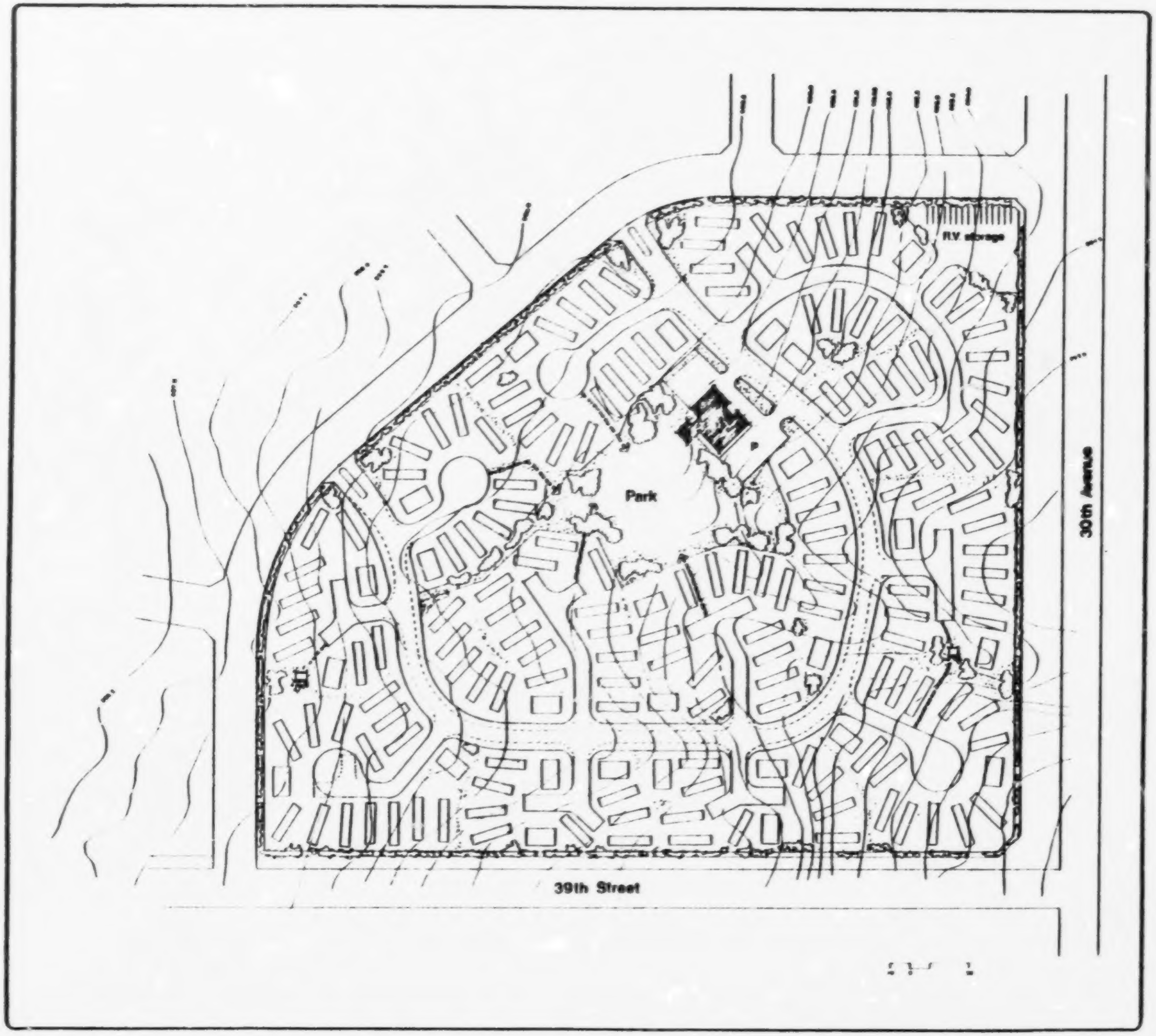
2.3 Cluster Layout

Figure 20 depicts a design based on a single internal loop road serving a number of small ten to thirteen unit clusters. The aim is to create small identifiable housing groups, each with a small access road, turning space and visitor parking. Resident parking would not be permitted on the street but a minimum of two off-street parking spaces will be provided for each unit. Double wide units are strategically placed to add variety to the streetscape and monotony is avoided by the cluster design and curved loop roads.

A central recreation area of 1.0 hectares (2.47 acres) is provided and a site for a club house/community centre is shown. Again, the feasibility of providing a club house/community centre may be marginal in a community of this size.

The development is totally inward looking and is surrounded by a landscaped buffer strip. Space for recreational storage is provided and access can be gained to this facility either internally or from the adjacent collector street. Only the internal access is shown on the plan.

Overall, this design approach offers the most radical departure from traditional park and lotting concepts. However, it produced the best yield, lowest servicing costs and potentially the highest amenity of the three designs developed. As detailed in the servicing section, many of the road and utility standards are below the normal for a traditional Red Deer Subdivision but are considered to be more inkeeping with the community park concept proposed. The design attempts to move away from the normal practice which allows wide streets and rows of parked cars to dominate the streetscape. The road designs are a function of the volume, type and destination of the traffic using them. The cul-de-sacs are designed to allow access and turning of emergency vehicles and garbage trucks by means of a



legend/notes

LAND USE	AREA		% OF GROSS DEVELOPABLE
	HECTARES	ACRES	
GROSS DEVELOPABLE	[illegible]	[illegible]	100
PARK	[illegible]	[illegible]	[illegible]
BUFFER	[illegible]	[illegible]	[illegible]
R.V. STORAGE	[illegible]	[illegible]	[illegible]
ROADS - 19 m R/W ROADS - 8 m R/W	[illegible] [illegible]	[illegible] [illegible]	
TOTAL ROADS	[illegible]	[illegible]	[illegible]
NET DEVELOPABLE	[illegible]	[illegible]	[illegible]

# SINGLE LOTS	[illegible]
# DOUBLE LOTS	[illegible]
TOTAL # OF LOTS	[illegible]
GROSS DENSITY	[illegible] units/ha ([illegible] units/ac)
NET DENSITY	[illegible] units/ha ([illegible] units/ac)

N

contour interval 0.50 m

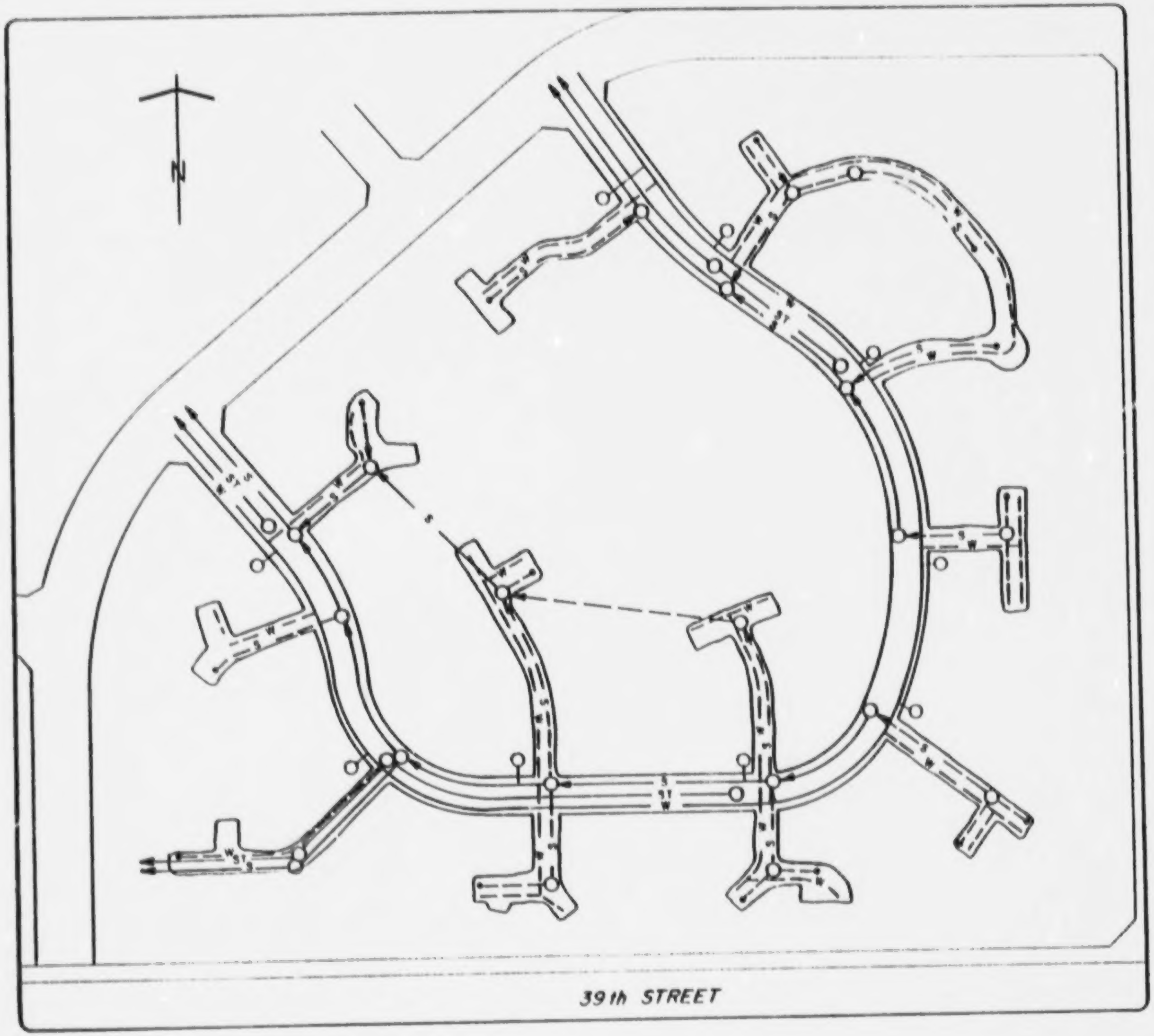
Manufactured Housing Association
Red Deer, Alberta

CLUSTER LAYOUT

figure

20

DelCan



ESTIMATED COSTS

19m ROW/7m P 690m @ 179.90	$113,136
8m ROW/6m P 940m @ 138.80	130,472
300ø - 550m @ 85.00	46,750
Manholes - 5 @ 2000	10,000
Catch Basins - 10 @ 1100	11,000
250ø - 100m @ 75.00	7,500
Curb & Gutter 1300m @ 30.00	39,000
150ø - 640m @ 65.00	41,600
Hydrants - 9 @ 2500	22,500
150ø Valves - 5 @ 500	2,500
150ø Fittings - 4 @ 200	800
50ø - 940m @ 35.00	32,900
50ø Valves 17 @ 100.00	1,700
50ø Fittings - 22 @ 50.00	1,100
50ø Blowoffs - 11@ 100.00	1,100
20ø Service 3200m @ 20	64,000
150ø - 820m @ 60.00	49,200
Manholes - 18 @ 2000	36,000
100ø - 900m @ 50.00	45,000
100ø Service 3200m @ 50.00	160,000
Cleanouts - 9 @ 500	4,500
Nat Gas - 1580m @ 25.00	39,500
U/G Power & Tel - 1580m @ 25	39,500
St. Lighting 640m @ 12.00	7,680
178 @ 150	26,700
178 @ 100	17,800
TOTAL	955,638

COST PER UNIT $5,368

Manufactured Housing Association
Red Deer, Alberta

SERVICES FOR
CLUSTER LAYOUT

figure

21

DeLCan

three point turning movement. Figure 21 presents the servicing and development costs for this design. Table 5 presents a summary of comparative densities and yields for three designs.

The cluster design approach is highly recommended as the basis for a private manufactured housing community.

TABLE 5

COMPARATIVE STATISTICS: DENSITIES AND YIELDS

	TRADITIONAL	MODIFIED TRANSITIONAL	CLUSTER
	hectares (acres)	hectares (acres)	hectares (acres)
Gross Site ha (acres)	11.52 (28.48)	11.52 (28.48)	11.52 (28.48)
Park	0.93 (2.30)	1.23 (3.04)	1.00 (2.47)
Buffer	0.17 (0.42)	0.57 (1.40)	0.53 (1.30)
RV Storage	-	0.11 (0.27)	0.12 (0.29)
Roads	2.41 (5.96)	1.89 (4.68)	1.65 (4.07)
Net Developable	8.01 (19.79)	7.72 (19.08)	8.22 (20.31)
Percentage Park/ Buffer	9%	16%	14%
Percentage Roads	21%	16%	14%
Total No Lots/Units	170*	176	178
Density Gross ha (acres)	14.76 (5.97)	15.28 (6.18)	15.45 (6.25)
Density net ha(acres)	21.22 (8.59)	22.80 (9.22)	21.65 (8.76)

* Based on average 13 metre wide lots.

*To achieve this lot yield 27 lots must be serviced via the peripheral collector road. This would effecitvely increase the gross site area 11.92 ha (29.47 acres) the road area to 2.81 ha (6.94 acres) and the percentage roads to 23.6 percent.

THE MANUFACTURED HOUSING ALTERNATIVE

PART III - ASSESSMENT

section 1.0

PART III - ASSESSMENT

1.0 RED DEER AUTHORITY COMMENTS

Copies of letters containing comments on the design proposals follow.

Please Quote Our File No.

THE CITY OF RED DEER

P.O. Box 5008
RED DEER, ALBERTA
T4N 3T4
TELEPHONE 346-2776
346-3731

OFFICE OF
FIRE PREVENTION BUREAU

February 17, 1983.

Subdivision Review Committee,
City of Red Deer.

RECEIVED
FEB 28 1983

Re: Manufactured Housing Subdivision
30 Avenue and 30 Street

In reply to the design study and letter of February 14, 1983 from Manufactured Housing Association of Alberta regarding the above proposed subdivision:

For fire access routes, we would prefer Proposed plan 1A or 2A because there is a direct access to most buildings on the site.

I had a meeting with Mr. D.J. Horner and find their association prefers plan 3A which presents some problems for us as there are a number of dead end roadways. Please find enclosed a copy of Plan 3A which has all roadways numbered. The following roadways should be changed by having a cul-de-sac having center line radius of not less than 12m instead of a hammerhead at the end of Number 2,5,8, 10 &11 roadways.

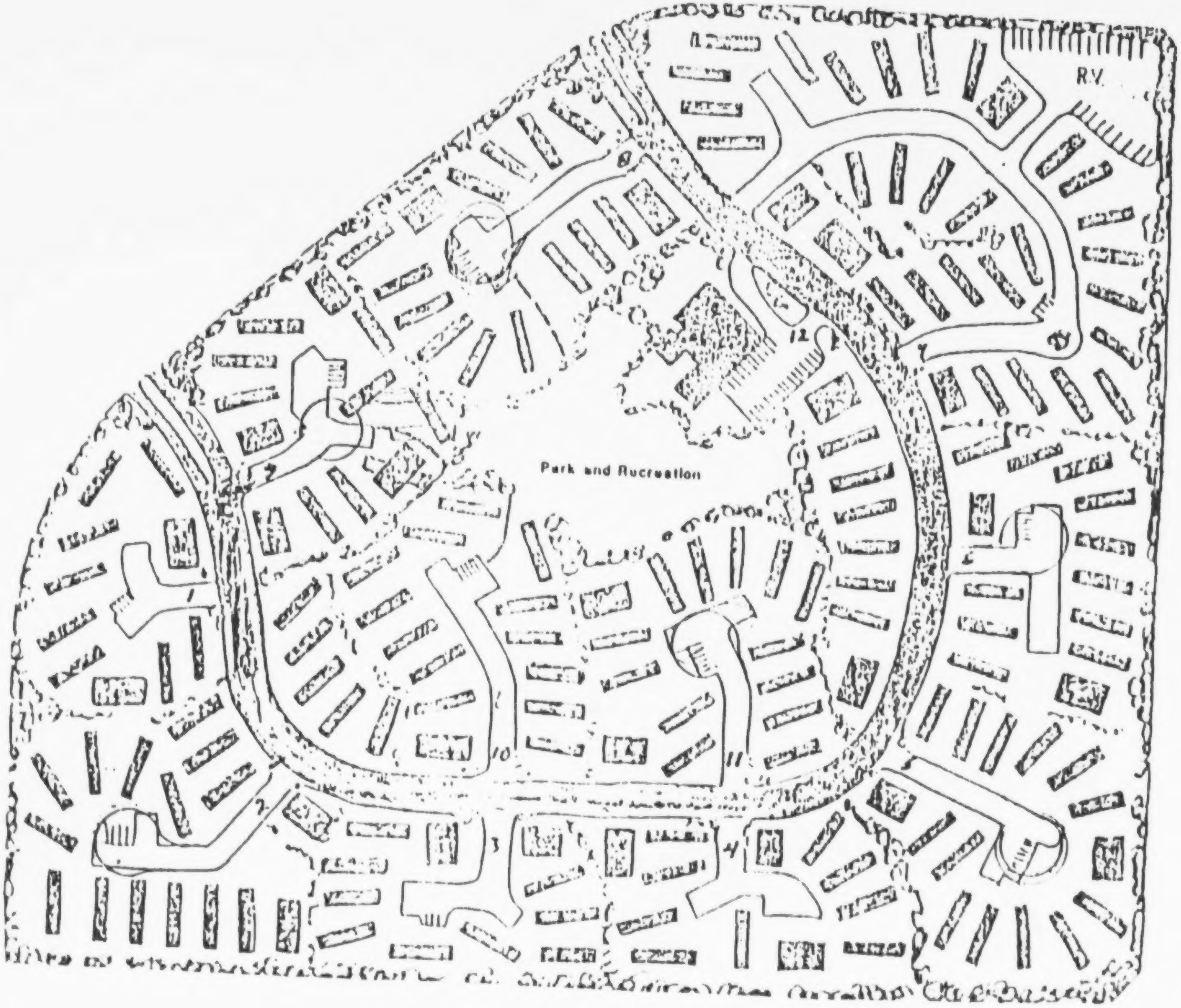
All roadways to have a clear width of at least 6m with approved signs showing no parking. If parking is permitted a 9m roadway would be required as per Sec.3.2.5.2. Alberta Building Code.

The sizing of the main water line be increased to a 200mm instead of 150mm and looped back to the city water line; stub lines to hydrants may be 150mm for adjacent fire flow.

Prior to finalization of project, a plan showing Fire Hydrant locations to be submitted.

Please contact my office if there are any further questions.

D.W. Johnson,
Fire Marshal


R.V.
Park and Rucreation
12
1
2
3
4
10
11

February 18, 1983.

TO: Mayor Bob McGhee
Sub-Division Review Committee

FROM: Fire Chief

RE: Manufactured Housing Association of Alberta
30 Avenue and 30 Street

RECEIVED
FEB 28 1983

I have reviewed the design study and letter from the Manufactured Housing Association of Alberta, and wish to express some concerns I have in this matter.

While I recognize that the developers objective is to provide attractive low cost housing, the plan he favors (3A) is difficult to service from a fire fighting or ambulance operation point of view.

The dead end streets or hammerheads place some buildings remote from the street serving them, which results in longer hose lays from a fire pumper to the fire building.

The parking at the ends of these dead end streets further congests access for fire fighting or ambulance operation.

I have noted other problems which have occurred in other privately developed housing sites in Red Deer.

With minimum road widths and even though they are signed No Parking, parking still occurs on the street. Snow clearing is limited to pushing snow to the side of the street, again reducing road width.

I personally favor the developers plan 1A, meeting municipal standards for road width, water and sewer sizing etc.

Attached are Fire Marshal Johnson's comments with respect to this development.

R. Oscroft
Fire Chief

RO/ml

RED DEER REGIONAL PLANNING COMMISSION
2830 BREMNER AVENUE
RED DEER ALBERTA CANADA T4R [illegible]

DIRECTOR
Robert R. Cundy M.C.I.P.

TELEPHONE [illegible]

Your File No.
File No.

RECEIVED
FEB 25 1983

February 25th, 1983

Mr. D. Horner
Executive Director
Manufacture Housing Association of Alberta
#203, 4406 - 50 Avenue
RED DEER, Alberta
T4N 3Z6

Dear Sir:

Thank you for requesting our comments to Phase II of the report by DeLeuw Cather Western Ltd. entitled, "The Manufactured Housing Alternative".

Our comments concern the planning aspect and other matters such as servicing, fire protection, etc. will be dealt with by respective departmends. It is assumed that the report is an exercise in planning of Mobile Home Parks with management, not subdivision of individual lots. Our comments deal with this aspect of development.

The report contains three alternative designs known as 1A, 2A, and 3A for the same piece of land.

1. Density
The three design alternatives provide for a density of 44, 46, and 46 persons per hectare. They are well within the allowable density of 50 persons per hectare. Their gross density of units per hectare are 14.7, 15.3, and 15.4 respectively.

2. Road Design
Road plan for design 1A and to some extent plan 2A, are similar to typical residential layouts. Plan 1A appears to have the city standards of public roadways. The road plan of design 3A has a large loop with some eleven cul-de-sacs and a smaller loop. We would like to see that the length of some of the cul-de-sacs be shortened or possibly made into a loop similar to the loop located to the north-east corner. The City Engineering and Fire Department will be commenting on road standards, vehicular movement and fire protection.

. . . /2

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3. Parks - Open Space
Each design has a park area with some recreational building. These are for the use of people living in the Mobile Home Park and not open to public, and their maintenance would be the responsibility of Mobile Home management. The three proposals have about ten per cent of their area designated as park and recreation areas. We would recommend the park and recreation area in plan 2A be centrally located to be accessible to all people living in the Mobile Home Park.

4. Landscaping
Each lot appears to have area set aside around the home for landscaping, etc. It is not known who will be responsible for maintenance around the homes.

5. Parking
It was mentioned that each unit has two off-street parking stalls which is a good standard. Plan 3A indicates a number of visitors parking at the end of the cul-de-sac. This plan also shows R.V. storage area.

6. Lot Size
Individual lot sizes are not indicated, but Fire Department recommend the minimum standard of 6 metres between each unit must be complied with.

7. Garbage
An attempt should be made for screening the individual garbage bins or a screened compound serving a number of mobile homes shall be provided.

8. Fencing
Since it is a mobile home park a good design fence on the perimeter of the park is necessary for security reasons.

9. Street Lighting

10. Additions

11. Signs

12. Skirting or placing of units partly underground

13. Design or Type of Home

The above items require careful consideration by the Mobile Home Park management to create a pleasant and livable environment.

General Comments
Plans 1A, and 2A are acceptable with some small modifications. Plan 3A is also acceptable subject to complying with the City Engineering and Fire Departments

. . . /3

Please Quote Our File No 270-

THE CITY OF RED DEER

Office of
CITY ENGINEER

P O BOX 5008
RED DEER, ALBERTA
T4N 3T4
TELEPHONE XXXXXX 342-8158

February 28, 1983

Manufactured Housing Association of Alberta
Upstairs 4920-52 Street
RED DEER, ALBERTA
T4N 2C9

ATTENTION: MR. D. HORNER

FEB 28 1983

Dear Sir:

RE: Phase II - Design Development Stud

Members of the Engineering Department have now had an opportunity to review the above mentioned report. Our comments and observations are outlined herein.

We would preface our specific comments with some general statements. It has been indicated that it is the intention to develop this project as one property; that is there will not be separate titles to each manufactured home lot. This being the case our concern over some of the standards diminishes somewhat, as the City will not be responsible for the maintenance of the utility or roadway system. It should be emphasized that this letter is based on that premise and should it be the intent, either immediately or in the future, to subdivide this parcel we would have to re-assess the project and insist on a close adherence to our standards.

UTILITIES

Storm Drainage

- Generally concur with observations.
- If City owned property, swales would not likely be acceptable.

Waterworks

- It is our opinion that 500 l/d per trailer maybe low for Red Deer.
- Pipe size should keep available system pressure in mind.
- Page 14 - saving in pipe cost for 2" vs 6", 50 mm vs 150 mm is approximately $7.35/m not $20.00/m as shown (using PVC).

...2

as well as the points mentioned earlier in this report.

Yours truly,

D. Rouhi, M.C.I.P.
SENIOR PLANNER
CITY PLANNING SECTION

DR/vl

c.c. - City Engineer
- Fire Chief
- City Assessor
- Secretary of AD HOC Subdivision Committee

- Dead end mains are maintenance problems - poor circulation.
- Hard to get initial negative bacteria test on dead end mains, however, they do exist on public property as well.
- Double service for water not acceptable to City because of possible access and legal problems.
- Minimum water service size is 25 mm.

Sanitary Sewers

- Velocity is approximately .75 m/second and satisfactory.
- Page 16 - difference in pipe price for 4" and 6" is $4.00/m not $6.00/m.
- 4" (100 mm) can be a potential sewer maintenance problem.
- Don't agree that sanitary sewers don't freeze, cover required 2.7 m.
- Minimum grades shown are less than Alberta Environment's guidelines and plumbing code.
- Would have serious reservation to sewer mains running under trailers if it was a City system.

ROADS

- Right-of-way widths are established to accommodate utilities, roads, walks and a buffer for future utility and/or road use. Another consideration is general appearance and control of the right-of-way in keeping front yard development as reasonable distance back from the driving surface.
- Pavement width is established to accommodate a certain usage, volume of and type of vehicle. With regard to usage on minor and cul-de-sacs we chosen to accommodate one (1) of two (2) options.

  (a) Two (2) travel lanes with provision to pass a stalled vehicle
  (3.75 + 3.75 + 2.5 = 10.0)

  (b) One (1) travel lane with extra side clearance to avoid contact with opening car doors and parking on both sides.
  (2.5 + 0.63 + 3.75 + 0.63 + 2.5 = 10.0)

  With regard to collector roads we have chosen to allow for the provision of the public transit system and the parked vehicle.
  (2.5 + 3.50 + 3.50 + 2.5 = 12.0)

  Another consideration in the establishment of pavement width is the requirements of the Fire Department Regulations which usually calls for a vehicle access route of at least 9.0 metres in width.

  This report indicates road widths of seven (7) and six (6) metres. We are not certain that these would be acceptable to the Fire Department and should be checked. We do feel that any parking on the street would cause significant problems. Even with a parking ban the roadways are considered narrow and may result in problems.
- In City developments, curb and gutter is provided to ensure positive area drainage and to define the road area.
- Cul-de-sacs are designed with a 13.0 radius face of curb to permit a passenger (turning radius 7.3 m) and a single unit moving truck, fire engine and/or garbage truck (turning radius 12.8 m) to turn around. Experience indicates that the bulbs are never free of parked vehicles, therefore,

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. . . /3

Please Quote Our File No 270-006

THE CITY OF RED DEER

Office of
CITY ENGINEER

P.O. BOX 5008
RED DEER, ALBERTA
T4N 3T4
TELEPHONE XXXXXX 342-8158

February 28, 1983

Manufactured Housing Association of Alberta
Upstairs 4920-52 Street
RED DEER, ALBERTA
T4N 2C9

FEB 28 1983

ATTENTION: MR. D. HORNER

Dear Sir:

RE: Phase II - Design Development Study

Members of the Engineering Department have now had an opportunity to review the above mentioned report. Our comments and observations are outlined herein.

We would preface our specific comments with some general statements. It has been indicated that it is the intention to develop this project as one property; that is there will not be separate titles to each manufactured home lot. This being the case our concern over some of the standards diminishes somewhat, as the City will not be responsible for the maintenance of the utility or roadway system. It should be emphasized that this letter is based on that premise and should it be the intent, either immediately or in the future, to subdivide this parcel we would have to re-assess the project and insist on a close adherence to our standards.

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Yours truly,

D. Rouhi, M.C.I.P.
SENIOR PLANNER
CITY PLANNING SECTION

DR/vl

c.c. - City Engineer
- Fire Chief
- City Assessor
- Secretary of AD HOC Subdivision Committee

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...3

even with this design, trucks may have to back up two (2) or three (3) times. No indication of radius for this development are indicated.
- Sidewalks are provided on both sides of local and dead end roadways to provide for mail and paper delivery, general pedestrians and a place for children to ride bikes, etc.. This is an issue currently under review.
- Road costs vary extensively from area to area depending on what subgrade conditions are encountered and what items are included in the estimate. Therefore, we have no comment.
- City standards prevail to accommodate not only the initial construction but also follow up maintenance operations such as snow removal and/or plowing to one (1) side.

We trust these comments will be of assistance to you in finalizing your study. Staff memebers of the Engineering Department would be pleased to discuss the matter further with you.

Yours truly,

B. C. Jeffers, P. Eng.
City Engineer

BCJ/KGH/RG/emg

Please Quote Our File No

THE CITY OF RED DEER

RED DEER, ALBERTA

OFFICE OF:
FIRE PREVENTION BUREAU

TELEPHONE 346-2776
346-3731

April 19, 1983.

Manufactured Housing Association
of Alberta
#203, 4406 - 50 Avenue
RED DEER, Alberta.
T4N 3T4

RECEIVED
APR 25 1983

Att: David J. Horner
Executive Director

Dear Sir:

Re: Proposed Manufactured Housing
30 Avenue and 39 Street

I have studied the interim report from DeLeuw Cather Western Ltd. on the above proposed project and my comments are as follows:

(1) Relating to your comments regarding our letter of Feb. 17 on page 13 of your report in which was stated "hose can reach over 150 metres and the fire truck would not have to enter the cul-de-sac if the truck enters the cul-de-sac and then lays hose back to the hydrant".

I would like to correct the writer on the above statement in that: hose can reach any length, however it is pre-connected and carried and laid by the fire truck. It is very hard to manhandle 63mm or 76mm hose 150M or even 38mm hose. The fire truck lays 63mm hose from the hydrant to the fire, then uses 38mm hose from fire truck to extinguish fires in manufactured homes.

(2) As I indicated in my previous letter of Feb. 17, a 12M radius cul-de-sac would be required in all the longer dead-end roadways, with no parking on roadway or cul-de-sac.

(3) Access for fire department equipment shall be provided as per Section 9.10.20.5 of the Alberta Building Code.

.... continued ..

Please contact my office if there are any further questions.

Yours truly,

D.W. Johnson
Fire Marshal

DWJ/ml

c.c. Subdivision Review Committee
c/o Mayor Bob McGnee

R E D   D E E R   R E G I O N A L   P L A N N I N G   C O M M I S S I O N

2830 BREMNER AVENUE
RED DEER ALBERTA CANADA T4R 1M9

DIRECTOR
Robert R. Cundy M.C.I.P.

TELEPHONE (403) 343-3394

Your File No

Our File No

April 21st, 1983

Mr. D. Horner
Executive Director
Manufactured Housing Association of Alberta
#203, 4406 - 50th Avenue
RED DEER, Alberta
T4N 3Z6

Dear Sir:

Re: Innovative Housing Grants Program
The Manufactured Housing Alternative

Thank you for forwarding Phase III of your interim report for our review and comments. The following are in addition to our previous letter dated February 25, 1983.

In page 8 of your report under Zoning, a number of statements are made that do not correspond with our present City Land Use Bylaw. I have corrected this section as per the attached sheet. You may use all the regulations, or part of it, in your report. As to the item regarding maximum size of mobile home parks, the 40 acres is only a recommendation and is not part of the Land Use Bylaw; it could be larger than 40 acres.

I trust the above information is satisfactory.

Yours truly,

D. Rouhi

D. Rouhi, M.C.I.P.
SENIOR PLANNER
CITY PLANNING SECTION

RECEIVED
APR 25 1983

DR/vl
Encl.

c.c. - Mayor R. McGhee
- Mr. B. Jeffers, City Engineer
- Mr. R. Strader, Development Officer

MUNICIPALITIES WITHIN COMMISSION AREA

CITY OF RED DEER—TOWN OF BLACKFALDS—TOWN OF BOWDEN—TOWN OF CARSTAIRS—TOWN OF CASTOR—TOWN OF CORONATION—TOWN OF DIDSBURY—TOWN OF ECKVILLE
TOWN OF INNISFAIL—TOWN OF LACOMBE—TOWN OF OLDS—TOWN OF PENHOLD—TOWN OF ROCKY MOUNTAIN HOUSE—TOWN OF STETTLER—TOWN OF SUNDRE—TOWN OF SYLVAN LAKE
VILLAGE OF ALIX—VILLAGE OF BENTLEY—VILLAGE OF BIG VALLEY—VILLAGE OF BOTHA—VILLAGE OF CAROLINE—VILLAGE OF CLIVE—VILLAGE OF CREMONA—VILLAGE OF DELBURNE
VILLAGE OF DONALDA—VILLAGE OF ELNORA—VILLAGE OF GADSBY—VILLAGE OF HALKIRK—VILLAGE OF MIRROR—SUMMER VILLAGE OF BIRCHCLIFF—SUMMER VILLAGE OF GULL LAKE
SUMMER VILLAGE OF HALF MOON BAY—SUMMER VILLAGE OF NORGLENWOLD—SUMMER VILLAGE OF ROCHON SANDS—SUMMER VILLAGE OF WHITE SANDS—COUNTY OF LACOMBE No. 14
COUNTY OF MOUNTAIN VIEW No. 17—COUNTY OF PAINTEARTH No. 18—COUNTY OF RED DEER No. [illegible] COUNTY OF STETTLER No. [illegible]—IMPROVEMENT DISTRICT No. [illegible]

LAND USE BY-LAW

The City of Red Deer has incorporated in their Land Use By-Law #2672/80 a district called 'Residential Relocatable Dwelling Unit" district or R4. The purpose of this district is to provide for residential development in a form of mobile home park, or mobile home subdivision.

The mobile home park or subdivision is a discretionary use and they are regulated by the provision of the Land Use By-law.

The following table outlines part of the Land Use By-law requirements related to mobile home park and/or subdivision in Red Deer.

	Relocatable Dwelling Unit Park	Relocatable Dwelling Unit Subdivision
1. Floor Area	25 m^2	25 m^2
2. Building Height	Maximum one storey	Maximum one storey
3. Front yard	Minimum 6 m	Minimum 6 m
4. Side yard	Minimum 1.5 m	Minimum 1.5 m
5. Rear yard	Minimum 6 m	Minimum 6 m
6. Landscaped area	Minimum 44% of site area	Minimum 44% of site area
7. Parking	As required by M.P.C.	One per unit
8. Loading space	N/A	N/A
9. Site Area	As required by M.P.C.	Single Unit - Min. 371 m^2 Double Unit - Min. 418 m^2
10. Frontage	15 m	Single Unit - Min. 12 m Double Unit - Min. 15 m

The site plan for mobile home park is subject to M.P.C. approval.

The City of Red Deer also has a document known as "Mobile Home Parks Recommended Standards, 1970". This is designated as a guideline for people wishing to establish a mobile home park in Red Deer. This document is only a guideline and is not part of the Land Use By-law.

File: 270-050
Please Quote Our File No

THE CITY OF RED DEER

P.O. BOX 5008
RED DEER, ALBERTA
T4N 3T4

Office of
CITY ENGINEER

TELEPHONE 342-8158

May 18, 1983

RECEIVED
MAY 24 1983

Manufactured Housing Association of Alberta
203-4406-50 Avenue
RED DEER, ALBERTA
T4N 3Z6

ATTENTION: MR. D. J. HORNER

Dear Dave:

My apologies Dave for our late response to your April 12, 19[illegible] correspondence.

My staff and I have reviewed the brief submitted and our comments follow. I would preface our comments by stating that should the Manufactured Housing Development being comtemplated be implemented as one (1) property (a private park), our concerns are somewhat alleviated.

In the comparison of Plan 1 - Plan 3 and the density summaries it is indicated that the Plan 1 lot widths are thirteen (13) metres (forty-two (42) plus feet). There is no indication of the width used in the other two (2) plans. If the same width is used, fine, if however, lots are used then obviously the density achieved on the other plans will be greater.

With respect to the general comments made on page 11 of the brief, they are all generally statements of the obvious and we do not disagree, with the possible exception of point #5; it might prove worthwhile to show the plan to the local garbage collector and solicit his response.

Point #9 is also a point we do not necessarily accept but again, if it is a private development it may be of little consequence. We would recommend strongly that you have the Fire Department's opinion of small water mains, hydrant placement, dead end streets, etc..

In the respect to the utilities, we would offer the following comments. The brief indicates "Manufactures list price differences of $22.80/ metre for two (2) inch PVC pressure pipe vs six (6) inch PVC pipe.

...2

We phoned Westburne April 20, 1983 - the price difference is $12.04/ metre, a little over half what was quoted in the brief.

Our standard design criteria is 360 l/day per person, not per unit.

The comments with respect to the dead end water levies are well taken.

- The minimum size for water services in Red Deer is 25 mm not 19 mm because of low pressure areas. This standard also applies in Calgary in low pressure areas.

Again with respect to the sanitary sewers we contacted Westburne, they indicated a price difference of $3.77/metre for the specified pipe sizes not $5.50/metre as quoted in the brief.

We disagree completely with the comment that plugging of sewers is not related to the size of the pipe. When items such as disposable diapers, wash cloths, etc. are flushed into the sewer, and it does happen, four (4) inch pipes are more prone to plugging than six (6) inch. We question the practical experience of those making these comments.

Freezing of sewers is a problem people should not have to contend with. Steep gradients cannot always be achieved.

A six (6) metre pavement surface in an eight (8) metre right-of-way results in approximately 0.6 metres on each side. This is not enough space for sidewalks, utilities, snow removal, etc..

Dave, these comments are for the most part negative, we don't wish to be considered negative to the "concept." We feel it has potential and a place in the housing market. We are rather expressing concern over some of the aspects often referred to as "innovative design."

Yours truly,

B. C. Jeffers, P. Eng.
City Engineer

BCJ/emg
cc - RDRPC, Mr. Rouhi

section 2.0

2.0 SITE PLANNING ASSESSMENT

2.1 Density

The summary table (Table 5) shows the comparative statistics for each design.

The percentage of roads required to serve the area has been reduced from 21 percent in the the traditional subdivision design to 14 percent with the cluster concept. This is a significant improvement and provides an opportunity to gain more area for housing units, park and buffer areas. It should also be noted that the effective percentage for roads on Figure 16 would be increased to 23.6 percent if that portion of the west perimeter collector road which has frontage is included in the calculations. Overall the cluster concept with narrower streets has reduced the area required for roads by 40 percent.

A gross density of 14.76 units/hectare was achieved with the small lot (13 metre frontage) traditional subdivision. The cluster concept achieved a gross density of 15.45 units/hectare. Although this increase does not appear large, a significant land area, which could have been used for housing, has been used to improve project amenities i.e. larger park, increased buffer strips and a recreational vehicle storage area.

It should also be remembered that each lot in the manufactured housing park has been designed to accept the largest 4.9 m (16 foot) x 23 m (76 foot) homes which represents 113 m^2 (1216 square feet) of ground floor living space. Because of this requirement lot areas cannot be reduced much below 370 m^2 (4,000 square feet). This site area would allow for a car port and minimum outdoor privacy area of 50 m^2 (540 square feet). It is not recommended that modern manufactured housing parks be planned with densities significantly higher than that shown. The site amenities and lot area capable of accommodating the large homes are essential if the development is to be successful. Development density will always remain lower than the average multi-family project or small 25-30 foot lot subdivisions. However, the manufactured home is a single family form of dwelling and must therefore be compared with project offering similar amenities and accommodation.

2.2 Legal Concerns

It is important at this point to discuss the various ways in which manufactured homes can be developed in a community context. The following definitions have been adapted from a paper prepared by the Manufactured Housing Association of Alberta, titled "The Role of Manufactured Housing in Residential Uses and Development, 1982".

Manufactured Housing Park

A manufactured housing development which utilizes the manufactured home, that does not have a registered subdivision plan of lots under single ownership, and which is managed by a park developer/operator where responsibility for design, placement and maintenance of internal roads, underground services, communal areas and buildings, together with general park management including snow clearance and garbage collection, etc., rests with ownership and management.

Manufactured Housing Subdivision

a) Without management - a manufactured housing development registered as a subdivision containing lots under free-hold tenure, where the responsibility for the design and maintenance of streets or roads and underground utilities rests with the municipality which may also assume responsibility for snow clearance and garbage collection.

b) Under Management - a manufactured housing development registered as a subdivision containing lots either under free-hold or lease-hold tenure, where the responsibility for the design, placement and maintenance of streets and roads, under-ground services, communal areas and buildings, together with general park management including snow clearance and garbage disposal, etc., rests with park management. This type of development may be in the form of a co-operative or strata title housing concept.

The existing legislation in Alberta does not permit the creation of a strata title for land in the same way as the Condominium Act allows a building to be developed as a condominium with multiple titles. In British Columbia provision does exist to create a bare land strata title whereby each homeowner can have title to a portion of the overall development.

It is hoped that legislation could be introduced in Alberta to allow this form of ownership which would combine the benefits of home and land ownership with the park/community concept.

Long term leases of 15 or 20 years are now being implemented by some park developers and while this will help to offer security to home owner it does fall short of the strata title concept which offers security, equity and a say in the management and administration of the development.

2.3 Zoning

The City of Red Deer has incorporated in their Land Use Bylaw a R-MH Residential Mobile Home District. The purpose of the district is to provide for "residential development in the form of mobile home parks and mobile home subdivisions".

Generally, the minimum standards for privacy, space separation, building height etc. do not create any limitations. However, in most cases higher standards would be desirable. However, under the Discretionary use rules, Set 25 (5)(a)(i), mobile home parks are limited to a maximum site area of 16 hectares (40 acres). At 16 units per hectare this would allow a 256 unit park to be developed. It may be desirable to consider allowing the development of larger parks to enable for example, a local convenience store, recreation and clubhouse facilities as well as maintenance staff and equipment to be economically supported within the site.

As with traditional housing areas there is no reason for a size limitation provided that good design, maintenance and management are incorporated. If an upper limit or size were to be imposed, it is recommended that it be in the 350 to 450 unit range and based on the merits of the development proposal.

Based on the comments received from the Red Deer authorities a development similar to that illustrated in Figure 20 could be developed under existing legislation provided it was designated as a Park where maintenance and management were the responsibility of the park owner.

2.4 Transferability of the Concept

Although a site in Red Deer was selected for the purposes of conceptual planning and municipal input, we believe the principles involved in the planning and engineering are appropriate for other locations in Alberta and across Canada.

The idea of a well planned fully serviced manufactured housing community is well established in the United States and to a lesser degree in Canada. Many of these developments cater to retired people who enjoy the lifestyle and it provides a unique oportunity to have the benefits of a single family dwelling within a controlled community atmosphere. It also provides the opportunity to introduce cost savings by bringing servicing standards back to a realistic level. This flexibility is not possible with most traditional housing subdivisions.

section 3.0

3.0 SITE SERVICING ASSESSMENT

3.1 Capital and Operating Costs

Part II discussed a number of options for reducing capital construction costs and applied these options to three design concepts. Capital cost savings were achieved from two broadscope areas:

1. Site planning - efficient site layout of the development led to shorter lengths of roadways and utilities serving more homes with greater amenity and environment.

2. Servicing - efficient design standards for roads and utilities led to reduced unit costs for roads and services.

The comparative unit development costs were as follows:

- Conventional layout and servicing standards: $7,473. per unit
- Conventional layout with modified servicing standards: $6,029. per unit
- Cluster concept layout with modified servicing standards: $5,368. per unit

Operating costs of existing parks were difficult to determine because some owners were not prepared to give out such information. For the owners that did give out the information, it was found that operating costs vary tremendously depending on the level of service and amenity provided. Some owners provide grass-cutting services for the tenant's front yard, garbage collection, snow removal, swimming pools and tennis courts, and even shrubbery for the tenant to landscape around his unit. Other owners provide none of these services.

The direct operating costs of roads and utilites for each of the three design schemes presented in Part II should not differ significantly. The difference will lie mainly with the level of park management and extra services the owner wishes to provide.

The elements of park design which are felt to influence maintenance costs are as follows:

1. Installation of utilities to run under the homes is not desirable and will increase maintenance cost whenever a pipe needs replacement.

2. Provision of properly located valves, shut offs, insulation and heat tape will reduce maintenance costs on water services.

3. Provision of adequate cleanouts and proper gradient on sanitary sewer service connections will reduce maintenance costs on sewer services.

4. Provision of short narrow dead-end roads for small clusters will reduce the length of storm sewers and catchbasins and result in lower maintenance costs.

5. The hammerhead design does result in an extra movement for garbage collection vehicles. This might involve an extra two minutes of turn-around time for each dead-end road, or approximately $3.00 for every ten homes.

   This time loss assumes that garbage collection always operates at peak efficiency and no time is lost for other reasons. For all practical purposes it is felt that the extra movement does not present a significant increase in operation cost.

6. Provision of no curb and gutter on short dead-end roads can result in increased maintenance costs because grassed areas can more easily be destroyed. The extra cost of providing curb and gutter may be offset by achievement of a neater, more defined roadway and lower maintenance cost.

7. Side swales instead of storm sewers on local streets are lower in capital cost, but have a higher maintenance cost if they are to be kept clean and neatly trimmed.

8. Annual energy costs can be reduced by the use of high pressure sodium street lighting.

9. Smaller watermains and sanitary sewers as suggested, should not require higher maintenance provided they are installed with adequate cover, bedding and properly compacted backfill.

3.2 Red Deer Authority Comments

Section 1.0 contains copies of the comments received by various Red Deer Authorities on Part II report and design concepts. Our response to these, taken in turn, are as follows:

1. Fire Marshall and Fire Chief (February 17, 18/1983)

   The minimum roadway width provided is, in fact, 6 metres with an 8 metre right-of-way and no parking allowed. It is felt that the one-metre boulevard on either side (or 2 metre boulevard on one side) should be adequate for snow storage on these short streets.

A 150 mm diameter looped watermain is proposed to service some 176 homes. Because it is looped, it should adequately carry the fire flow at any point in the line without significant pressure loss. It should be noted that there is no contemplation of reduction of fire flow standards in the proposed mobile home design concepts. In the particular example it was felt that a 150 mm main would suffice. Larger parks, or where mains cannot be looped should be designed to always carry the required flow for the size of development proposed.

The length of the hammerhead dead-end streets in the cluster design scheme was intentionally kept to under 100 metres, with a hydrant located at the start of each street. Since modern hoses can reach 150 metres, it is envisioned that the fire-truck would not have to enter the cul-de-sac. Although this entails a longer hose layout, the same applies if the truck enters the cul-de-sac and then lays hose back to the hydrant.

2. Red Deer Regional Planning Commission (February 25, 1983)

Comments are addressed in Section 2.0.

3. City of Red Deer - City Engineer (February 28, 1983)

Waterworks

- Manufacturer's list prices for PVC pressure pipe are as follows:

2 inch diameter	$ 1.66/metre
6 inch diameter	$13.70/metre
DIFFERENCE =	$12.04/metre

- Consumption of 500 l/d was derived from records of several existing, developments, some in Red Deer. These showed a winter range of consumption of 300-400 l/d and a summer range of 400-650 l/day. It is difficult to see why an average guideline figure of 500 l/day should be considered low.

  - Dead end waterlines do sometimes have poor circulation. We have attempted to compensate for this by limiting dead-end lengths to 100 metres and using a 50 mm diameter pipe, inducing greater velocities. We also provide a blow-off standpipe at the end of the line for regular cleaning.

  - A double service connection for water services should not present an access problem if the tee and valves are located within the road right-of-way.

  - Minimum water service size for conventional single-family homes has traditionally been 19 mm. If a double service is used, we concur the minimum size should be 25 mm.

Sanitary Sewers

- Manufacturer's list prices for PVC sewer pipe (SDR 35) are as follows:

4 inch diameter	$1.80/metre
6 inch diameter	$5.57/metre
DIFFERENCE =	$3.77/metre

- The statement that a 100 mm diameter sewer can be a potential maintenance problem is based, we presume, on the premise that smaller pipes plug more often than larger pipes. In practice, it is found that any size pipe can plug and the frequency of occurrence is related to factors other than pipe size. Our own feeling is that for the low flows generated from a cluster of a dozen homes, a smaller pipe with a steeper gradient will induce greater velocities and be less subject to sedimentation. When the steeper gradient cannot be achieved, the larger pipe should of course be used.

- Sanitary sewers do freeze. However, the sewer serving the small cluster of 10-12 homes will generally be either empty, or with the steeper gradient, running at a velocity in excess of 0.75 metres/sec. It is felt therefore that the cover requirement in this instance can be reduced to 2 metres. For collectors on the main road, cover should be maintained at 2.7 metres.

- The desirable gradients suggested will produce a velocity of 0.75 metres/sec in the respective pipe sizes when flowing full. This has generally been recognized as a more than adequate self-cleansing velocity. It is suggested that absolute minimum gradients, inducing a velocity of 0.6 metres/sec., can be used when significant economies can be achieved. Many municipalities have laid sewers to even lower gradients because of rock or high water table, without noticeable increases in maintenance costs.

- Concur with reservations related to sewer mains under homes.

Roads

- The cluster type cul-de-sacs which are limited to 10-12 homes do not carry much traffic. A 6 metre pavement within an 8 metre right-of-way has been used successfully in many areas without any user hardship.

- Fire Marshall's comments indicate a minimum pavement width of 6 metres for emergency vehicles.

- Concur with observations on curb and gutter.

- Hammerheads were used in the site plan to add interest and increase efficiency. We concur that bulbs, if used, should be designed to a minimum 12 metre radius. Although the hammerhead may require an extra movement for a garbage truck, it is felt that the improved appearance and the opportunity to provide visitor parking is an advantage over the bulb. Both can be used efficiently in specific areas.

4. City of Red Deer - City Engineer (May 18, 1983)

"Thank you for your comments to Dave Horner dated May 18, 1983. We appreciate the fact that your comments are not so much "criticisms" but concerns over some of the suggestions in the study. For this reason we will attempt to address some of these concerns on behalf of the MHAA.

Point 1: All lot widths on all three plans are based on a minimum of 13 metres (5 metres for the width of the home and 8 metre separation as per CMHC guidelines).

Point 2: The garbage collector's comments would indeed be worthwhile. It should be kept in mind however, that we are not attempting to espouse the hammerhead design for use in all dead-end streets; bulbs are also acceptable. The main points we would like to highlight are:

a) short dead-end streets appear to be efficient in mobile home layouts;

b) the hammerhead end is slightly more efficient (and attractive) for mobile home layouts because of the homes' long narrow shape;

c) combinations of hammerhead and bulb ends can be used in a development;

d) the extra turning movement for garbage collection vehicles is not judged to be significantly more costly.

Point 3: Comments from the Fire Marshall were received on February 17, 1983 and April 19, 1983.

Points 4 & 7: Your comments related to pipe prices are correct due to recent decreases in manufacturer's list prices. You should note however, that in comparing the total costs of the three schemes we have used the following unit prices for the installed utility:

	6" Diameter	2" Diameter
Watermain	$65.00/metre	$35.00/metre
	6" Diameter	4" Diameter
Sanitary Sewer	$60.00/metre	$50.00/metre

The above comparison was drawn from prices tendered on contracts in 1982. As of late, installation prices have also dropped, and it is difficult to say what the future will hold. The main point is that there are savings to be realized by using smaller pipes; the relative difference will vary with the economic situation. We will correct the report to reflect current prices as closely as possible.

Point 5: While we realize that normal design criteria for the traditional subdivision is 360 l/day/person, actual recordings of water consumption at several mobile home rental parks showed a winter consumption of 300-400 l/day/unit and a summer range of 400-650 l/day/unit. We do not know the exact number of persons in each unit. Generally the rental parks tend to have an average in the order of 2.5 persons/unit. If a design criteria of 500 l/day/unit is adopted, this would yield a per capita consumption of 200 l/day.

It may be because of larger proportions of retired people, or to centralized laundry facilities, or to smaller yards, or to combinations of these and other reasons, but we have found that on the whole, mobile home rental parks tend to use less water per capita than traditional subdivisions. For this reason we have suggested that a lower average daily design figure can be used.

Point 6: We agree that in low pressure areas a water service should be 25 mm. However, this size need not be applied arbitrarily to all areas and in zones of normal pressures, a 19 mm water service should suffice.

Point 8: We do not advocate that 4" sewers be used arbitrarily to replace 6" sewers. We merely suggest that in clusters of a dozen homes or less, a 4" sewer would suffice if adequate gradient can be achieved. House services are currently 4" diameter and subject to plugging. Certainly, we feel that the current minimum standard of 8" diameter for a cluster of 10 to 12 homes is excessive.

Again, our suggestions are not intended to be "miracle cures" but merely an effort to stem the tendency to a "bigger is better" attitude. Some municipalities now insist on minimum 10" sewers for all applications. It is true that people do attempt to dispose of items into a sewer which they shouldn't, and this causes blockages. However, this problem would more logically be attached from the user end, rather than to provide larger and larger pipes and challenging the user to block them.

Point 9: We are suggesting a reduction of cover only when proper gradients, which preclude freezing, can be achieved.

Point 10: We do not propose to have sidewalks in the short dead-end streets and utilities are within the street. In regions of high snow accumulations, the road can be offset to one side, leaving two metres for snow piling. In the City of Calgary, local streets are not plowed or sanded unless they are very steep.

We reiterate that these comments are not made in any antagonistic way but in a spirit of co-operation. The manufactured housing industry has made great strides in producing economical homes of good quality. In the same spirit, we feel developers and municipalties should co-operate to achieve economical servicing designs while maintaining reasonable levels of quality. In this way, the total package to the consumer should be affordable, attractive and easily maintainable. We hope you will view our philosophy in the same "light".

THE MANUFACTURED HOUSING ALTERNATIVE

PART IV - CONCLUSIONS AND RECOMMENDATIONS

section 1.0

PART IV - CONCLUSIONS AND RECOMMENDATIONS

1.0 CONCLUSIONS

The examination of eight mobile home developments in Red Deer confirms the historical problems that have plagued the industry. Land used for mobile homes has traditionally been considered a temporary use until a higher and "better" use can be achieved. For this reason, mobile home developers have not been anxious to outlay large capital expenditures on amenities and services. The attitude has been: why spend large sums of money if the area is to be re-zoned sometime in the future?

The arrival of CSA Certification for manufactured housing and the immplementation of permanent zoning for manufactured home districts has led to a greater degree of confidence on the part of the developer and consequently more attractive and serviceable developments. Nevertheless, traditional subdivision design practice in the site-built sector has been merely transferred to the manufactured housing concepts with less than desirable effects.

Manufactured homes are rigid in their exterior shapes because of constraints in transport. Consequently, site planning for mobile homes cannot be limited to the edge of the street right-of-way as in the site-built development. Site planning for mobile homes must consider comprehensively the street layout as well as location of driveways, placement and orientation of each home, landscaping, privacy areas, etc. The interior layout of the homes must also be considered in the site layout so that adequate privacy is maintained. The entire site must be comprehensively planned in a fashion similar to a large townhouse development.

This study has examined a number of methods that can be used in site planning to achieve interesting streetscapes and attractive surroundings for the mobile home dweller. These are summarized in the Recommendations section.

The report has also examined numerous ways in which economies can be achieved in the servicing of mobile home developments. The servicing guidelines generated may also be used effectively for site-built home subdivisions provided the necessary approvals can be obtained. For the moment, they are recommended for mobile home park developments only where the owner is responsible for the maintenance. As these become implemented, owners are well advised to keep accurate records of maintenance costs and transfer this information back to the City authorities in the jurisdiction, so as to prove that operation and maintenance costs do not necessarily increase by the use of smaller roads, pipes, etc. In this way, City authorities may be able to examine the possibilities for more economical subdivisions whether they can be of manufactured homes or site-built homes.

section 2.0

2.0 RECOMMENDATIONS

a) Proposed Site Planning Guidelines

1. To be cost effective and provide adequate amenities, manufactured housing parks should have at least 25 acres (10 hectares) or 200 homes. However, manufactured housing communities in the 50-75 acres (20-30 hectares) 300 to 450 unit range appear to offer substantial benefits in terms of management, maintenance, and amenity provision.

2. Avoid mixing old homes with new homes.

3. Avoid visual monotony by introducing curved street geometry and variation in setback and orientation of units.

4. A comprehensive landscaping plan is essential and should be planned and costed as part of the overall project from the outset. Basic requirements include grassed areas around the units with a minimum of two trees per unit. Shrubs and bushes should be planted close to the homes to help improve the transition between grass and siding thus breaking up the hard lines of most manufactured homes.

5. Ten percent of the site should be planned as open space park area.

6. Each home should have space for two off-street parking stalls and it is preferrable that parking not be permitted on street. With off-street parking provided pavement widths can be reduced to 6 m (20 feet).

7. An outdoor privacy area of at least $50m^2$ (540 square feet) should be planned adjacent to each home. This space should not be overlooked by habitable room windows in adjacent units.

8. The separation between units should be at least 4.5 m (15 feet).

9. The setback from the street should also be a minimum of 4.5 m (15 feet).

10. Single-wide sites should be planned to accommodate 4.9 m (16 foot) wide and 21 m (70 foot) long homes.

11. A separate storage compound for recreational vehicles should be provided using a minimum standard of 1 space for each 10 homes.

12. The cluster housing concept appears to work particularly well if clusters are planned with 10 to 15 units.

b) Proposed Site Servicing Guidelines

1. Roadways

The recommended roadway minimum design widths are as follows:

		R.O.W.	Pavement
Collector Road	(1000-5000 veh/day)	20	10
Local Road	(100-1000 veh/day)	14	7
Dead-End Road	(0-100 veh/day)	8	6

It is recommended that no on-street parking be allowed.

2. Drainage

For short dead-end streets (less than 100 metres) no storm sewer is required and drainage routing should be along the right-of-way. Curb and gutter is desirable for appearance and lower maintenance.

Local roads should have storm sewer if curb and gutter is provided. Roadside ditches, properly constructed and maintained, are acceptable in a rural context.

3. Waterworks

The following general guidelines are suggested:

- average daily domestic flow: 500 litres/unit/day
- minimum size of distribution mains: 150 mm diameter
- provide adequate storage for fire flow
- minimum size on dead-end streets (less than 100 m) 50 mm diameter
- hydrants at all entrances to dead-end streets
- minimum hydrant spacing on local streets: 150 m
- 50 mm standpipes or blowoffs recommended at ends of dead-end streets

- minimum depth of bury: to local frost penetration
- watermains under units are not recommended.

4. Sanitary Sewers

General recommendations for mobile home developments are as follows:

a) Sewers running directly under homes are acceptable in a private park development, but not desirable for a municipally-operated development.

b) 100 mm diameter sewer may be used on short (less than 100 metres) dead end roads provided adequate gradient can be achieved.

c) Local roads should use a minimum 150 mm diameter pipe.

d) A 200 mm diameter pipe should be used when more than 500 units are served or when a flatter gradient offers economy.

e) The following minimum grades should be used.

	Desirable	Absolute Minimum
100 mm pipe	1.5%	1.0%
150 mm pipe	0.8%	0.5%
200 mm pipe	0.5%	0.35%

f) Curvilinear sewers are permitted within the manufacturer's recommended deflections on each joint, and only one horizontal or vertical curve should be used between manholes.

g) Manhole spacing should be related to the reach of rodding equipment locally available. Modern power rodding equipment can generally reach up to 200 metres, with some special equipment reaching up to 300 metres. For private parks, a reasonable average spacing would be in the order of 175 metres.

appendices

MOBILE HOME PARKS
RECOMMENDED STANDARDS

REVISED AUGUST 18, 1970
CITY OF RED DEER

APPENDIX 1

SITE REQUIREMENTS:

Size:- The most economic size for mobile home parks has been found to be in the region of 20 to 40 acres which would provide the most economic return for the investment required by these standards. The minimum recommended site area therefore is 20 acres, and the maximum recommended site area is 40 acres. Sites larger than 40 acres and smaller than 20 acres will be considered on their merit, but visually they could become unsatisfactory, as well as uneconomic.

Density:- Maximum density should not exceed 8 trailers per gross acre.

Open Space:- 10% of the gross site area shall be used for open space purposes to be provided by the following alternatives:-

(a) small sites of not less than 5000 square feet located at strategic points within the layout.

(b) as one large area located within the site, with convenient access from all trailers.

(c) as a combination of (a) and (b) above.

Landscaping:- Detailed landscaping proposal must be deposited with the final layout plan, and must include proposals for tree or shrub buffer strip of a minimum width of 10 feet around periphery of the site, which shall not be considered as part of the open space provision required above. Should it prove desirable the defined trailer lots may extend into this area.

Roads & Streets:- All streets and footpaths within the site shall be paved to a standard required by the City Engineer for residential subdivision development.

The minimum width of a right-of-way within the site shall be 40 feet, with a carriageway of not less than 32 feet, and the remainder of the right-of-way shall be landscaped.

Utilities & Services:- All utilities and services shall be underground and provision shall be made for the installation of natural gas supply.

Parking:- In addition to the individual trailer lot space, a parking area shall be provided at the rate of 1 space for every 10 trailer lots for the parking of trucks, etc.

Storage:- A screened compound for the storage of tent trailers, boats, etc. shall be provided. Provision shall be made at the rate of 750 square feet for every 10 trailer lots.

Service Buildings:- Where necessary shall not be nearer than 20 feet to any trailer.

Display:- Provision may be made within the site for the display of not more than two manufacturers show homes. However no retail sales of trailers shall be permitted from the site without the approval of the M.P.C.

Fire:- A fire hydrant shall be provided so that no trailer is more than 250 feet from a hydrant, i.e. one hydrant at 500 foot intervals, depending on layout, to be approved by Fire Chief.

Street Lighting:- An outdoor street and/or footpath lighting system shall be provided.

Signs:- Not more than one free standing identification sign shall be permitted, the design to be approved by M.P.C.

A. Size:- The minimum frontage of any lot shall not be less than 35 feet and minimum depth of any lots shall not be less than 75 feet.

Space About Trailer and Attachments:- No trailer, or any attachment buildings associated with a trailer, shall be nearer than 15 feet to an adjacent trailer, or any attachment building. No trailer shall be located within 10 feet of the front property line of a lot adjoining an internal street nor within 25 feet of the front property line of a lot which adjoins a public road or right-of-way.

Skirting and Attachments:- Total floor space of attachments shall not exceed ½ of the total floor space of the trailer and shall be painted to present the same appearance as the trailer. As part of the above space allowance a prefabricated storage shed not exceeding 8' x 8' shall be permitted on each lot provided it is located in accordance with the immediately preceeding paragraph. Skirting shall be provided and painted to match the trailer located on the lot.

Landscaping:- The developer shall be responsible for the landscaping of the total site, together with the individual lot, and its maintenance and replacement where necessary.

Garbage:- Provision shall be made for screening individual garbage bins, or a screened compound serving a number of trailers shall be erected.

Fencing:- No individual fencing or hedging shall be permitted, unless the developer accepts responsibility for its erection and maintenance on a total provision for all trailer lots to a uniform standard.

Definition of Lots:- Lots shall be defined by curb or post at the corner of each lot. See fencing, etc.

Parking:- A minimum of 1 car space must be provided on each trailer lot which must be paved, or gravelled to an approved standard.

Fuel Tanks:-

In the case of gravity feed fuel oil systems external storage tanks shall be located in such a way that two or more tanks shall be located within a screened compound serving two or more trailers.

Conversion to natural gas supply is recommended whenever possible in the case of propane units.

Plans:-

Detailed plans shall be required indicating site layout, servicing and utility layout, together with details of connection to City Utility services, landscaping contours, and existing site or land features to be retained.

Site Requirements:-

Every trailer shall be permanently levelled, blocked and skirting erected within 30 days of installation on the lot, or by 1st May if installed between November 1st and April 1st.

CITY OF RED DEER
LAND USE BYLAW
(EXTRACT)

RELOCATABLE DWELLING UNITS

APPENDIX 2

6.6.4 R-4 RESIDENTIAL (RELOCATABLE DWELLING UNIT) DISTRICT

6.6.4.1 General Purpose of District

To provide land for relocatable dwelling units and relocatable dwelling unit parks.

6.6.4.2 Permitted Uses

None

6.6.4.3 Discretionary Uses

(1) Relocatable dwelling unit park.

(2) Relocatable dwelling unit.

(3) Home occupation.

6.6.4.4 Regulations

(1) Floor Area: Minimum - 55 m^2

(2) Building Height: Minimum - N/A
Maximum - one storey

(3) Front Yard: Minimum 6 m.

(4) Side Yard: Minimum 1.5 m.

(5) Rear Yard: Minimum 6 m.

(6) Landscape Area: Minimum 44% of site area.

(7) Parking: Relocatable dwelling unit park - as required by the M.P.C.
Relocatable dwelling unit - one per unit.

(8) Loading Space: N/A

(9) Site Area: Relocatable dwelling unit park - as required by the M.P.C.
Relocatable dwelling unit -
Single wide - minimum 371 m^2
Double wide - minimum 418 m^2

(10) Frontage: Relocatable dwelling unit park - minimum 15 m
Relocatable dwelling unit -
Single wide - minimum 12 m
Double wide - minimum 15 m.

6.6.4.5 Special Regulation

(1) Notwithstanding Section 6.6.4.4 the site plan of a relocatable dwelling unit park shall be subject to approval by the Municipal Planning Commission.

(2) All relocatable dwelling unit parks shall comply with the Provincial Department of Public Health Regulations governing Mobile Homes.

(3) For all relocatable dwelling units not located in a relocatable dwelling unit park the following conditions shall apply:

(a) all relocatable dwelling units shall be placed upon a full foundation of poured concrete or concrete blocks or upon and affixed to concrete piers poured to a depth below frost level, or upon an approved treated wooden basement or foundation.

(b) If a relocatable dwelling unit is placed upon concrete piers, the same shall be skirted from the base thereof to the ground with material similar in design, construction.

(c) Any addition to a relocatable dwelling unit shall be constructed of material similar in design, construction and appearance to the exterior of the relocatable dwelling unit.

(d) All relocatable dwelling units shall conform to the standards of the Canadian Standards Association.

(4) All relocatable dwelling units shall be connected to the City's water and sewer systems.

DEMAND ASSESSMENT
RED DEER

D. J. HORNER

MANUFACTURED HOUSING
ASSOCIATION OF ALBERTA
MARCH 1982

APPENDIX 3

A MOBILE HOME
DEMAND ASSESSMENT
FOR RED DEER, ALBERTA

a Supplement to

THE ROLE OF MANUFACTURED HOUSING
IN
RESIDENTIAL USES & DEVELOPMENT

Prepared by:

David J. Horner, Executive Director
The Manufactured Housing Association
of Alberta
March, 1982

The research and interviews for this report were carried out in August, 1980, August, 1981, and during February and March, 1982.

It is intended to be objective in nature and without prejudice.

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I. AUTHORIZATION

On December 7, 1981, during a regular sitting of the Red Deer City Council, it was moved by Alderman Oldring, seconded by Alderman Hood, in light of the City Assessor's 1982 Residential Lot Projection, that:

> *...a committee of three Aldermen and the City Commissioners be established to review future subdivision needs prior to any action being undertaken on the above,*

...referring to the final design stage of Deer Park Subdivision.

At the request of the Committee, per the Assistant City Clerk, the Manufactured Housing Association of Alberta was invited to participate and, therefore, submitted their written presentation entitled, *The Role of Manufactured Housing in Residential Uses & Development*, by the required date [February 19, 1982].

Pursuant to the Assistant City Clerk's request of March 8, 1982, we herein submit our Demand Assessment as a part of the second presentation.

II. OBJECTIVE & SCOPE

The objective of this report is to assess the demand for mobile homes in the City of Red Deer for inclusion into subdivision site plans.

To achieve this objective, the study involved:

1. Compilation of an inventory of mobile homes and mobile home parks in Red Deer including
    - a. location;
    - b. number of lots;
    - c. current vacancy rates; and
    - d. site enquiries.
2. Studying the attitude of prospective purchasers of manufactured homes, and owners of manufactured homes.
3. Analyzing the constraints to demand; and
4. Circulation of a questionnaire to manufactured housing dealers.

III. DEMAND STUDY

A. In August, 1980, during a product show in Edmonton, 433 people were surveyed on their attitude toward mobile homes, as follows:[1]

1. Attitude toward purchase	*Yes*	68.6%
	No	27.2%
	* *N/R*	4.2%
2. Attitude toward home and attitude toward purchase	*Like*	89.4%
	Purchase	68.6%
3. Reasons given for buying home	*Price*	66.9%
	Layout	16.4%
	Convenience	21.3%
	Quality	19.7%
4. Purchase by location	*Urban*	72.5%
	Rural	79.5%
5. Purchase by # of dependents	*1*	80.0%
	2	79.5%
	3	77.3%
6. Attitude of respondents 60 years and older	*Buy*	71.6%
	Not buy	28.4%
7. Repeat purchases by owners of manufactured homes	*Buy*	85.7%
	Not buy	12.2%
	Not sure	2.0%

* *No Response.*

B. In August, 1981, a Focus Group Study of mobile home owners was conducted as a prelude to an advertising campaign, a consensus as follows:[2]

1. Consensus before purchase

-no resale value
-blow over in wind
-cold in winter
-ceiling not high enough.

---

1 - "Study of Attitudes Towards Manufactured Housing", Communitas Inc., August, 1980.

2 - "Manufactured Housing Focus Group Study", Baker Lovick, August, 1981.

2. Chose manufactured home because

   - *less maintenance (than conventional home)*
   - *variety of floor plans*
   - *individual features pleasing*
   - *affordable*
   - *living area on one floor; no stairs*
   - *no big mortgages*
   - *park setting.*

3. Features liked

   - *maintenance free*
   - *no stairs*
   - *easy to keep clean*
   - *attractive, good features*
   - *community spirit of park*
   - *security.*

4. All respondents agreed they would purchase another manufactured home.

5. None of the respondents would like to live on an acreage (or in a regular subdivision).

6. The group felt that thev were getting a good value for their dollar.

C. Market study of greater Red Deer:

1. Mobile home parks (Red Deer, Penhold, Blackfalds & rural)

   a. *928 spaces available*
   b. *9 vacancies*
   c. *.009% vacancy rate (February, 1982)*
   d. *average of 16 calls per day for spaces during February.*

   It is not known how many of these calls are repeat calls from the same caller.

2. Mobile home dealers (copy of questionnaire attached)

a. *total homes sold (of dealers reporting)*	1980 - 303 1981 - 448
% INCREASE	33%
b. *of the homes sold during 1981*	Rural - 79% Urban - 21%
c. *average sale price of*	
-single wide	$28,000
-double wide	$38,600

d. *sales not consumated due to*

-unavailable rental lots	75.8%
-unavailable financing	22.5%
-size not adequate	0%
-did not offer desired amenities	1.7%

e. *reasons for manufactured housing's gain in popularity?*
- *-high cost of mortgage interest rates* *
- *-affordability*
- *-retirement home*
- *-new building codes*

* During the month of February, three dealers reported showing homes to people who desired selling their present homes in favour of lower costs.

f. *sales lost during February, due to lack of available rental lots* 47

g. *demand for manufactured homes not being met*

Retirement & Young Family	*Yes*	100%
	No	0%

h. *preference of rental lots*	84.16%
preference of purchase lots	15.84%

3. Red Deer mobile home owners (copy of questionnaire attached) [a random sampling of four owners in two local parks]

a. average length of ownership *6 years*

b. 100% enjoyed living in a mobile home because
- *-cost of purchase (affordability)*
- *-all the conveniences plus carpets and appliances*
- *-enough space*
- *-good investment*
- *-no stairs*
- *-costs less to heat*

c. 100% enjoyed living in a park because
- *-good location*
- *-privacy*
- *-quiet*
- *-lower taxes*
- *-street and land maintenance provided*
- *-security*

Negative comments received regarding screening of tenants and lack of enforcement of rules by managers.

d. 100% found it more economical to live in a mobile home than to reside in an apartment or own a large home (payments and taxes).

e. 100% felt that more park space should be available, provided there was good quality management and maintenance.

Respondents' addresses:

47 Parkside Drive
20 Parkview Avenue
6960-63 Avenue (Mustang)
#602 Mustang Acres

D. Reasons for Demand for Mobile Homes and Parks.

This study addressed manufactured home non-owners and owners as to their attitudes towards and reasons for purchasing mobile homes. A survey of local dealers and parks was undertaken. The reasons a demand exists, as exemplified by these studies and surveys are:

Mobile Home

1. *Economy (affordability)*
2. *High cost of conventional mortgages*
3. *One-storey living (no stairs)*
4. *Low maintenance requirements*
5. *Costs less to operate*
6. *Conveniences, "everything a house has plus the appliances and carpets"*
7. *Variety of floor plans*
8. *Pleasing amenities.*

Mobile Home Park

1. *Lower costs (taxes, utilities)*
2. *Security*
3. *Community spirit*
4. *Good environment*
5. *Privacy.*

These findings show that mobile homes are not chosen as an alternative because they are "movable".

A Real Estate & Housing Department Study (1975) found that ...*the primary reason for purchasing a mobile home was that it was 'less expensive than a conventional home' (and) that it still provided the benefits of a single-detached dwelling.*

In order to show the economy feature of a mobile home in a park, we compared it to a 1,000 sq.ft. conventional home set on its own lot, as set forth in "E" following.

A COST COMPARISON - ECONOMY OF MOBILE HOMES

[NOTE: *these comparisons are computed on estimated 1983 prices*].

MOBILE HOME OWNERSHIP IN A PARK

VS.

CONVENTIONAL HOME ON-SITE

MOBILE HOME			CONVENTIONAL HOME
$31,000		1,000 sq.ft. Home	$55,000
15%		Down payment	10%
$26,350		Mortgage balance	$49,500
22%		Interest rate	19%
15 yrs.		Term	25 yrs.
$483.46		Monthly payment	$762.59
300.00	Lot Rent	Land Payment*	415.94
$783.46		Total monthly payment	$1,178.54
(Inc.)		ADD: water, garbage & power	50.00
(Inc.)		Land taxes	70.00
16.62		Mobile license fee	N/A
$800.08			$1,298.54

$498.46
DIFFERENCE

---

* Land payment [$30,000 @ 90% @ 19% interest over 25 years].

IV. CONSTRAINTS TO DEMAND

A. Unavailability of Lots (rental)

The lack of mobile home lots for rent in the Red Deer area is a major constraint to those persons who have seriously considered purchasing a mobile home.

As demonstrated in our mobile home park survey, page 3, there are no vacancies in local parks. The only exception to this is Northwoods Estates, where the owner has elected to refuse occupancy, notwithstanding the fact that it is incomplete and substandard.

B. Negative Attitudes

1. *Public Officials' Attitudes* - Planning officials and municipalities alike, tend to hold a negative attitude toward mobile homes, such that mobile homes are not viewed as a viable housing alternative. With the exception of Parkside Estates and part of Mustang Acres, this feeling is usually based on exposure to existing parks in Red Deer which are poorly planned, over-crowded, and ill-maintained; and a lack of knowledge of, or exposure to, modern manufactured housing product and parks.

2. *Adverse Publicity* - As recent as February and March, articles have appeared in "The Advocate", insinuating that mobile homes are the cause of fires and are, therefore, dangerous, when in fact there is no proof of these allegations whatsoever. In fact, recent conversations between this writer and the provincial fire investigator, the Red Deer Fire Chief, a major insurance company and Alberta Labour, in no way indicates that mobile homes are any more dangerous than any other housing form. Their comments are as follows:

   Earl Moker
   Fire Investigator
   Red Deer

   It makes no difference whether it's a mobile home or site-built home, if it's located in the rural area 15 to 20 minutes from a firehall, there's more of a chance that the home could be a total loss. Lack of water supply in some rural areas contributes to that loss.

   In my experience, we have not attributed construction quality as the cause of a fire in a mobile home. Almost all fires are attributed to human error. Checking heat tapes applied to all homes is the responsibility of the home owner.

Cyanide poisoning is a result of gases released from burning plastic materials, i.e., toilet lids and plastic cooking housewares. Gas and smoke emitted from these burning plastics generally overcomes the occupant before the fire itself.

Ray Pettersen, Vice-President
Underwriting
Elite Insurance Company
Vancouver

Any mobile home is insurable so long as it meets the insurer's criteria, even homes built fifteen years ago. The costs are comparable to site-built homes except where total loss is probable due to Fire Department response time.

Statistics from the Fire Prevention Branch indicate that 1980 was the first year in ten where the death rate in mobile homes was less than conventional one-family dwellings.

Bob Oscraft
Fire Chief
Red Deer

Newer mobile homes located within the city limits of Red Deer where Fire Department response time is equal to that of a conventional home have the same survival capabilities. Red Deer fire statistics show that:

During 1980 there were - 24 conventional home fires
20 apartment fires
0 mobile home fires

During 1981 there were - 17 conventional home fires
20 apartment fires
0 mobile home fires

During 1982 there were - 42 home fire responses
0 mobile home fire responses.

Additionally, mobile homes meet and often exceed the National Building Code, particularly as it relates to fire prevention and protection.

3. *Current Park Status* - With the exception of Parkside Estates and part of Mustang Acres, local parks are all sub-standard, without proper maintenance, are cramped and generally of low quality. Trailer City may be phased out as re-development of its site occurs. Again, negative opinions are generated by the appearance of these parks.

4. *Mobile Home Subdivision* - The City of Red Deer currently owns 13 unsold lots in Normandeau. Inadequate mortgage financing makes these lots undesirable. In addition to this, mobile home owners desire rental lots first, as the costs are much lower.

V. SUMMARY & CONCLUSIONS

A. Demand Assessment

The total unsatisfied demand for mobile home lots in Red Deer is estimated to be 302 to 550 units per year. This assessment is based on the following:

1. There are no vacancies (.009%) in Red Deer parks and surrounding areas.

2. Some mobile home parks maintain a waiting list now totalling 45. This amount is restricted to a maximum allowable. Other parks do not maintain lists as their tenants rarely move. Capitalizing this total at 25%, yields 180.

3. One Red Deer park may be phased out. Their original lots amounted to 160. 80 remain with no where to relocate.

4. Red Deer dealers reported 47 sales lost during February, 1982, due to lack of lots. Using a *mean* total of 25 per month over a year, yields 300.

5. Red Deer dealers reported 448 sales during 1981. 21% of these sales went to the urban market. 1981 sales increased 33% over 1980. 448 times 21% at 133% = 125 lots, capitalized at 50%, yields 250.

6. Red Deer anticipates a 23.5% growth during the next five years. Mobile homes represent 4% of the City's current dwelling units. Based on the foregoing together with an average of 2.65 persons per dwelling, 210 mobile home sites will be required over the next five years, or 42 lots per year.

B. Conclusions

Mobile homes are demanded because they are an affordable and economical alternative to conventional houses, not because they are movable. Mobile homes allows the opportunity to build equity and is often viewed as both a starter home and a retirement home.

The low figure in the demand range (302) represents the number of units which dealers are certain could be sold immediately, if lots were made available. The upper number (550) represents the number of units that could be sold, if certain restraints were removed.

ROAD COST PER 100 METRES

APPENDIX 4

APPENDIX 4

ROAD COST PER 100 METRES

1. 16 metre right-of-way/10 metre pavement

Sub-Grade Preparation: 16m x 100m = 1600 s.m. @ $1.20/s.m. =	$1,920.00
Stripping: 0.4m x 100m x 16m - 640 c.m. @ $5.00/c.m. =	3,200.00
Sub-Grade Preparation: 12m x 100m = 1200s.m. @ $0.80/s.m. =	960.00
Sub-Base: 12m x 100m x 0.2m = 240c.m. @ $17.00/c.m. =	4,080.00
Crushed Gravel: 11m x 100m x .1m = 110 c.m. @ 28.00/c.m. =	3,080.00
Primer: 10m x 100m = 1000s.m. @ $0.70/s.m.	700.00
Asphalt: 10m x 100m = 1000s.m. @ $10/s.m.	10,000.00
TOTAL	$23,940.00

2. 14 metre right-of-way/7 metre pavement

Clearing: 14m x 100m = 1400s.m. @ $1.20/s.m. =	$1,680.00
Stripping: 0.4 x 100m x 14m = 560c.m. @ $5.00/c.m. =	2,800.00
Sub-Grade Preparation: 9m x 100m: 900x.m. @ $0.80/s.m. =	720.00
Sub-Base: 9m x 100m x 0.2m = 180 c.m. @ $17.00/c.m. =	3,060.00
Crushed Gravel: 8m x 100 x 0.1m = 80c.m. @ $28.00/c.m. =	2,240.00
Primer: 7m x 100m = 700s.m. @ $0.70/s.m. =	490.00
Asphalt: 7m x 100m = 700s.m. @ $10.00/s.m. =	7,000.00
TOTAL	17,990.00

3. 8 metre right-of-way/6 metre pavement

Clearing: 8m x 100m = 800s.m. @ $1.20/s.m. =	$ 960.00
Stripping: 0.4 x 100m x 8m = 320c.m. @ $5.00/s.m. =	1,600.00
Sub-Grade Preparation: 7m x 100m = 700s.m. @ $0.80/s.m. =	650.00
Sub-Base: 7m x 100m x 0.2m = 140c.m. @ $17.00/c.m. =	2,380.00
Crushed Gravel: 7m x 100m x 0.1m = 70c.m. @ $28.00/c.m. =	1,960.00
Primer: 6m x 100m = 600s.m. @ $0.70/s.m. =	420.00
Asphalt: 6m x 100m = 600s.m. @ $10.00/s.m. =	6,000.00
TOTAL	13,880.00

UNIT COSTS USED FOR UTILITIES

A. Storm Drainage

300 mm storm sewer	$85.00/metre
250 mm storm sewer	$75.00/metre
Manholes	$2,000.00 each
Catch Basins	$1,100.00 each
Concrete Curb and Gutter	$30.00/metre
Grassed Swale	$6.00/metre
Paved Swale	$10.00/metre

B. Waterworks

150 mm pipe	$65.00/metre
150 mm valves	$500.00 each
150 mm fittings	$200.00 each
Hydrants (complete assembly)	$2,500.00 each
50 mm pipe	$35.00/metre

50 mm valves	$100.00 each
50 mm fittings	$50.00 each
50 mm blow-off standpipes	$300.00 each
25 mm service connection	$25.00/metre
20 mm service connection	$20.00/metre

C. Sanitary Sewers

200 mm sewer pipe	$70.00/metre
150 mm sewer pipe	$60.00/metre
100 mm sewer pipe	$50.00/metre
Manholes	$2,000.00 each
Cleanouts	$500.00 each

D. Shallow Utilities

Natural gas pipe (50 mm)	$25.00/metre
Underground Power and Telephone	$25.00/metre
Overhead Power and Telephone	$14.00/metre
Standard Street Lighting	$20.00/metre
Reduced Level Street Lighting	$12.00/metre

E. Service Connections

Water and sewer service box	$150.00 each
Gas, Power, Telephone service box	$100.00 each

MANUFACTURED HOUSING ASSOCIATION OF ALBERTA
4920 52ND STREET
RED DEER, ALBERTA
T4N 2C8

MOBILE HOME DEALER QUESTIONNAIRE

PURPOSE: *The purpose of this survey is to aid the City of Red Deer in determining the current and potential demand for mobile homes in the Red Deer area, and to determine the proportion of the population for which mobile-home sites should be designated.*

The information obtained from this questionnaire will be handled on a strictly confidential basis. Only aggregate data will be used in any reports or presentations resulting from the survey. Your co-operation in completing the questionnaire will greatly assist the Association in its study of the demand for mobile homes.

NAME OF FIRM________________________ MANAGER______________

ADDRESS____________________________ TELEPHONE____________

1. How many mobile homes did your firm sell:
   a) in 1980? ______
   b) in 1981? ______

2. How many mobile homes, during 1981, went into the:
   a) rural market? ______
   b) urban market? ______

3. What is the average price of your:
   a) single-wide home? $__________ to $__________
   b) double-wide home? $__________ to $__________

4. What portion of serious enquiries do not result in purchases due to:
   a) unavailability of rental lots? ______
   b) financing unavailable? ______
   c) size of home cannot meet family needs? ______
   d) home does not offer desired amenities? ______

5. What is the number of serious enquiries received per month, which do not result in a purchase, due to the lack of rental lots?
   ______ per month.

6. What, in your opinion, are the major reasons for manufactured homes' gain in popularity as a housing option [in order of importance]?
   ____
   ____
   ____
   ____

7. Do you feel there is a demand for manufactured housing that is not being met?
   Yes _____. No _____. If yes, why? ____________________
   ____
   ____

8. If the following options were readily available, what proportion of your customers would prefer:
   a) rental lots? ______
   b) owned lots? ______

9. If there were an unrestricted supply of lots available in Red Deer, what is your estimate of the demand for manufactured homes on:
   a) rental lots? ______
   b) owned lots? ______

MOBILE HOME OWNER SURVEY

(a sampling)

1. How long have you lived in your mobile home?

   ____

2. Do you enjoy living in a mobile home?

   Yes____ No____ Why? ______________________________

   ____

3. Do you enjoy living in a mobile home park?

   Yes____ No____ Why? ______________________________

   ____

   ____

4. Have you found it to be more economical living in a mobile home as opposed to:

   Renting? Yes____ No____
   Other housing form? Yes____ No____

5. Do you feel that a mobile home park should be included in all future city subdivision plans?

   Yes____ No____ Why? ______________________________

   ____

   ____

   ____

   ____

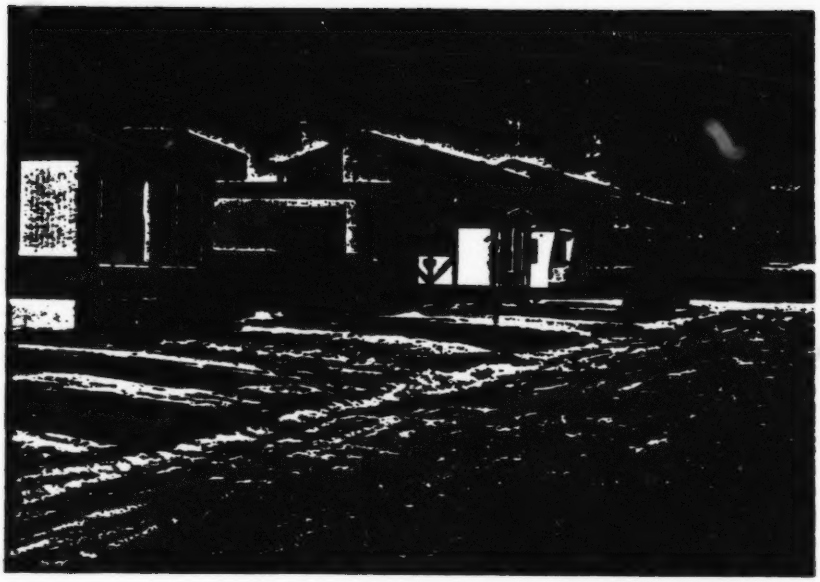
ADDRESS OF RESPONDENT ______________________________

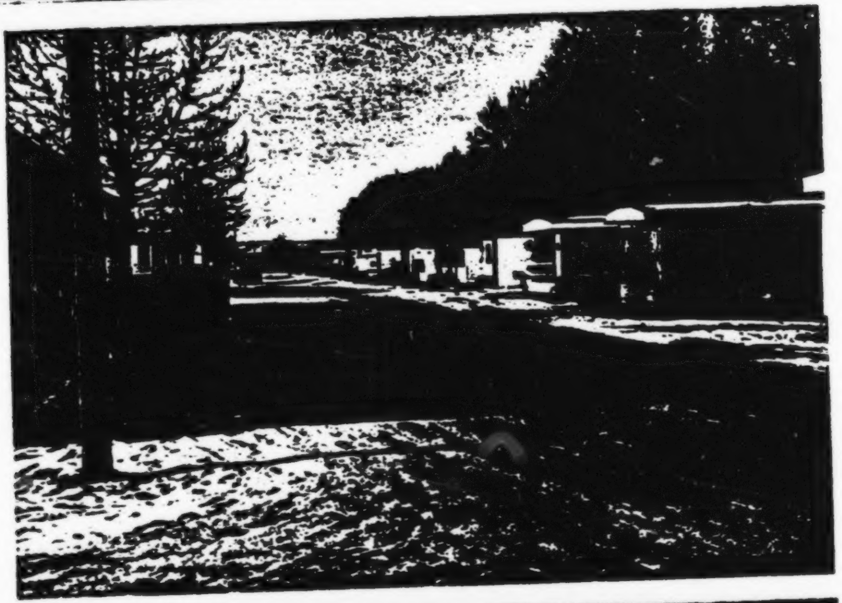
DATE ________________

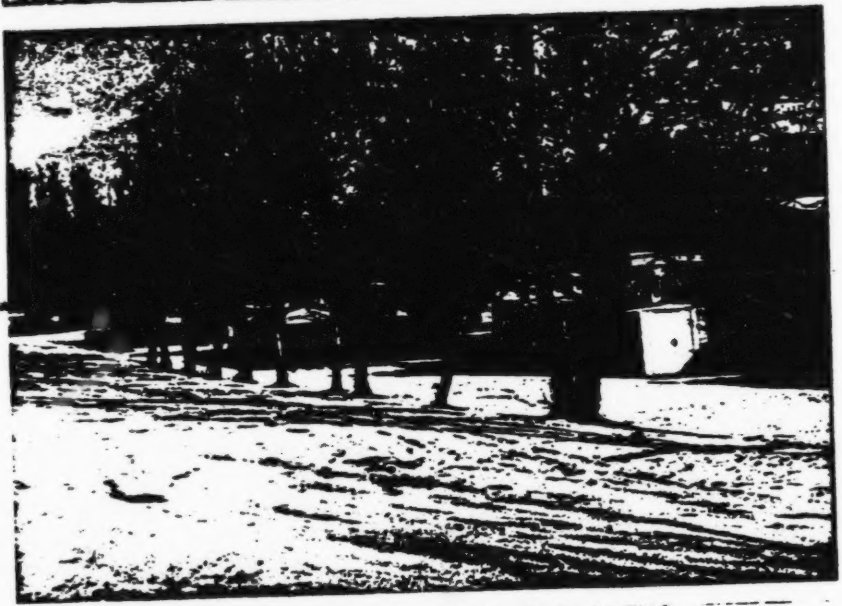
PHOTOGRAPHS

APPENDIX 5

MUSTANG ACRES

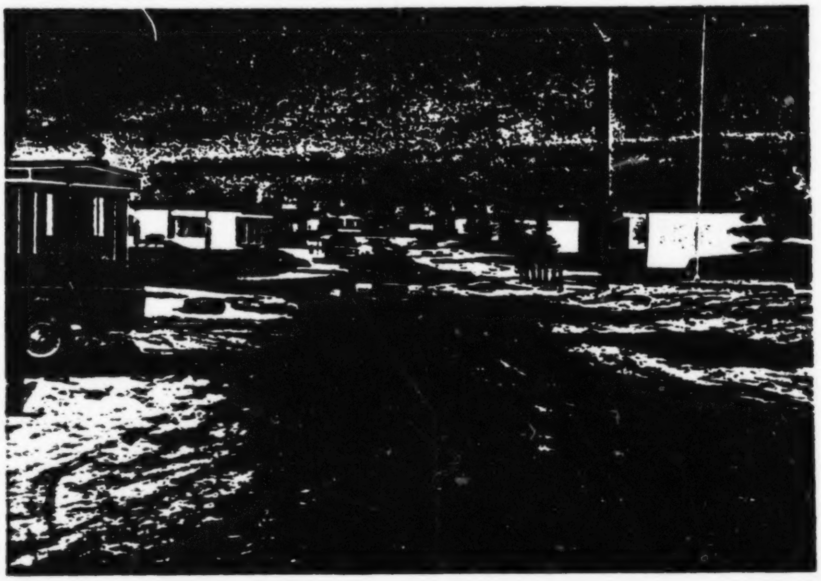


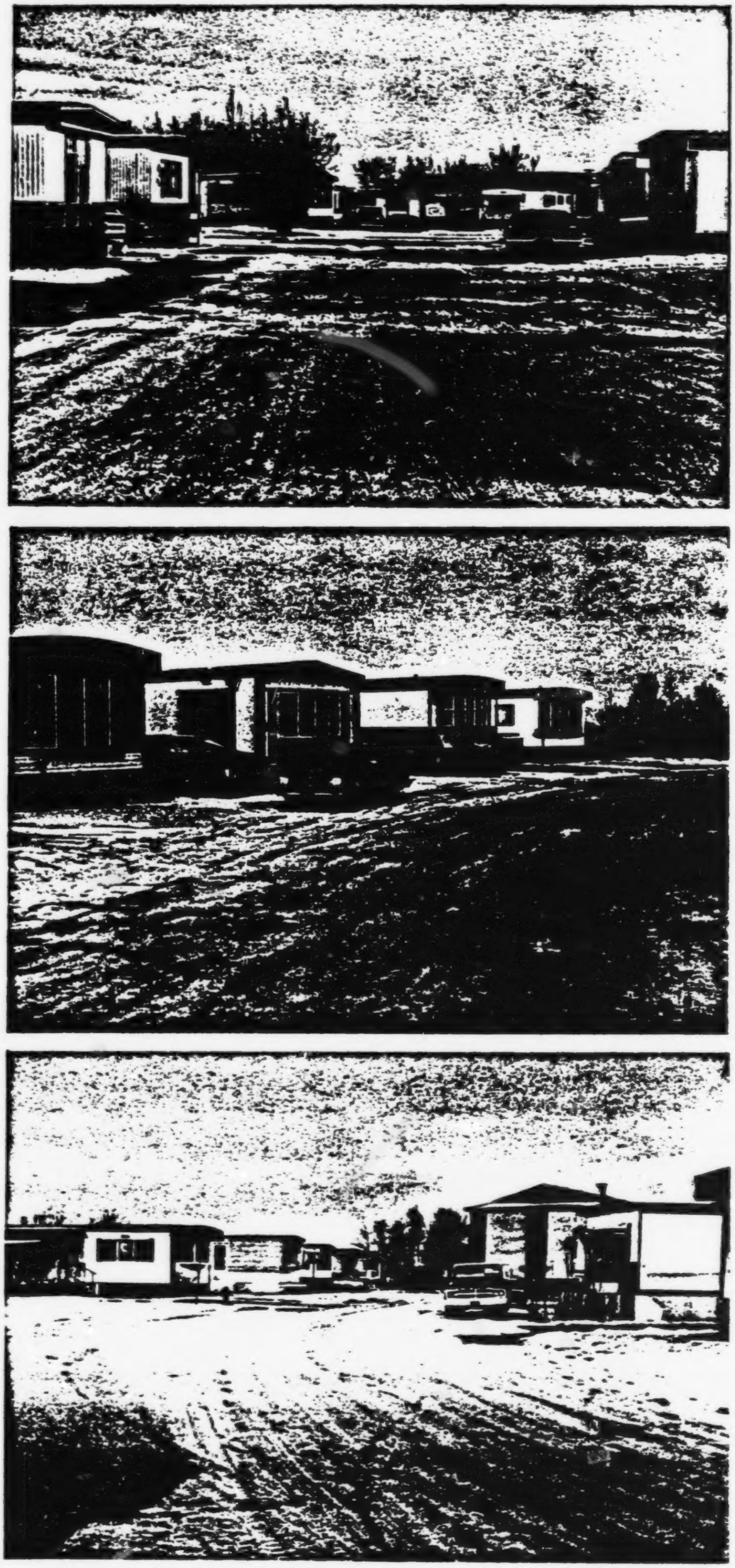




MUSTANG ACRES

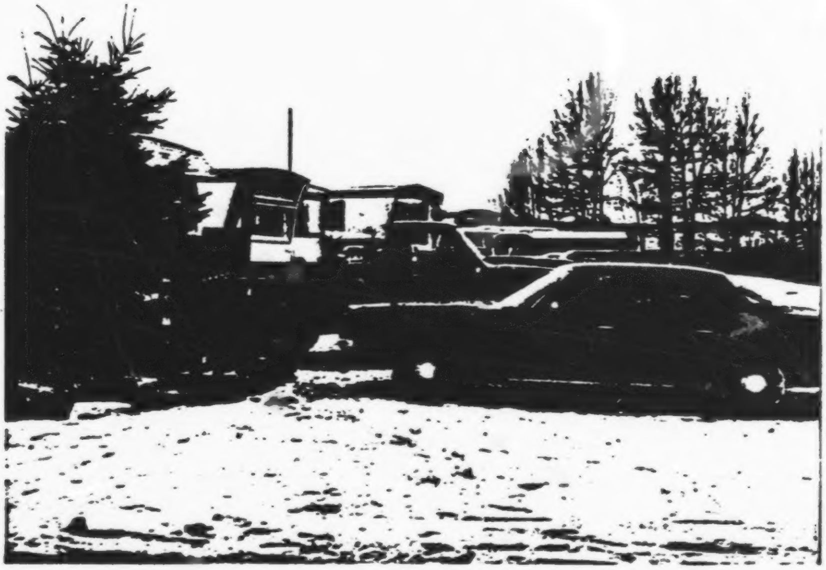
PARKSIDE ESTATES





TRAILER CITY

LES' TRAILER COURT



POOR

QUALITY

ORIGINAL